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# The Agricultural Situation in the People's Republic of China and Other Communist Asian Countries

Review of 1975 and Outlook for 1976



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#### ABSTRACT

In the People's Republic of China (PRC), all crops except cotton registered a record harvest in 1975, but achievements were below expectations. Gains in North Korea's agriculture were also below what was planned. The Democratic Republic of Vietnam had a slight drop in crop production, but a significant increase in livestock production. Crop output increased in 1975 in the Mongolian People's Republic, but livestock output fell below 1974 levels. U.S. agricultural exports to the PRC decreased significantly in 1975, and prospects for improvement in 1976 are dim.

KEYWORDS: People's Republic of China, Democratic Republic of Vietnam, Mongolian People's Republic, North Korea, agricultural production, agricultural inputs, agricultural policies, foreign trade.

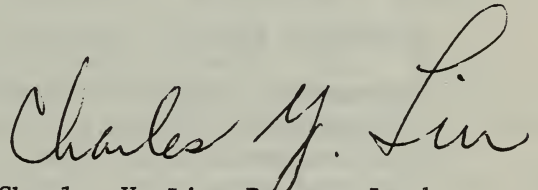
## FOREWORD

This report summarizes major agricultural developments in 1975 and the outlook for 1976 for the People's Republic of China (PRC), the Mongolia People's Republic (Mongolia), North Korea, and the Democratic Republic of Vietnam (North Vietnam). Emphasis is given to major developments in PRC agriculture.

Charles Y. Liu directed and coordinated preparation of this report. Authors of the PRC section are Marion R. Larsen, Charles Y. Liu, James R. Scullen, Frederic M. Surls, and Carolyn L. Whitton. Principal authors of other sections are Marion R. Larsen (North Vietnam and North Korea) and James R. Scullen (Mongolia). Marie Coleman and James Coogen also assisted in data collection. The 1975 agricultural situations in South Vietnam, Cambodia, and Laos are included in the report for Far East and Oceania.

The report updates and supplements statistics and other information found in Foreign Agricultural Economic Report No. 111, The Agricultural Situation in the People's Republic of China and Other Communist Asian Countries: Review of 1974 and Outlook for 1975. Unless otherwise indicated, it reflects the information through April 1976. Sources are not given in the report and are available on request.

Other agricultural situation reports have been published for the Soviet Union, Eastern Europe, Western Europe, the Western Hemisphere, the Far East and Oceania, and Africa and West Asia.

A handwritten signature in cursive script that reads "Charles Y. Liu". The signature is written in dark ink and is positioned above the printed name and title.

Charles Y. Liu, Program Leader  
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# CONTENTS

	<u>Page</u>
SUMMARY.....	iii
PEOPLE'S REPUBLIC OF CHINA.....	1
Agricultural Production.....	1
Crop Production.....	2
Livestock.....	8
Agricultural Policy.....	9
Fourth 5-Year Plan.....	11
Fifth 5-Year Plan.....	12
Agricultural Development: Tachai Model.....	12
The Tachai Model.....	13
Progress to Date.....	16
Basic Mechanization.....	17
Agricultural Inputs.....	18
Mechanization.....	18
Land Improvement and Water Control.....	24
Fertilizer.....	30
Seed Technology.....	32
Foreign Trade.....	33
Total Trade.....	33
Agricultural Trade.....	35
Trade with the United States.....	42
Trade Prospects.....	42
Outlook for 1976.....	44
MONGOLIAN PEOPLE'S REPUBLIC.....	47
DEMOCRATIC REPUBLIC OF VIETNAM.....	49
Economic Highlights.....	49
Agricultural Production.....	50
Crop Production.....	50
Livestock.....	51
Policy and Agricultural Inputs.....	54
Agricultural Trade.....	54
Outlook.....	56
NORTH KOREA.....	57
APPENDIX TABLES.....	61
CONVERSION EQUIVALENTS.....	65

## SUMMARY

The outlook for PRC agriculture in 1976 remains mixed. Although a massive program of rural capital construction works was undertaken last fall, weather conditions from October through early spring were not favorable for 1976 summer-harvested grains, including winter and spring wheat. Timely rains in late March, April, and most of May 1976 in the North China Plain and Northeast China relieved much of the drought conditions. There is no shortage of soil moisture in areas in southern China that produce early rice, but below-normal temperatures and cloudy skies persisted through April. Rice transplanting was delayed and rotting of seedlings was reported in some areas. Precipitation and soil moisture have continued at a level within or near the normal range. Assuming favorable weather up to harvest time and minimum acreage adjustments, prospects are for a early harvested grain crop (winter and spring wheat, early rice, barley, early corn and other minor crops) close to the magnitude of the record 1975 crop.

Prospects for U.S. agricultural exports to the PRC in 1976 are limited. Some cotton sales are expected because of rising world demand for Chinese textiles and a slight drop in PRC cotton production in 1975. Prospects for significant shipments of grains, soybeans, or other agricultural products are poor unless there are major problems with this year's harvest in China.

Agriculture in the PRC made less progress in 1975 than had been expected. In 1975, increases in PRC crop production were less than in 1973 and 1974. USDA estimates that grain output rose about 2 percent, from a revised 265 million tons in 1974 to a record 270 million tons in 1975. The increase would probably have been larger had it not been for unfavorable weather, which affected some crops, offsetting the mass infusion of agricultural inputs.

All industrial crops except cotton made slight gains in 1975. Cotton output decreased for the second year in a row, falling to an estimated 2.4 million tons. Soybean production rose somewhat in 1975, reaching an estimated 10 million tons. (This estimate reflects a revised USDA series for PRC soybean output, based on fragmentary information indicating increased area and yield in recent years.) Rapeseed production, estimated at 1.4 million tons, set a record in 1975. Production of other oilseed crops (peanuts and sesame) increased only slightly, while there was a decrease in cottonseed output.

Production of sugar, tobacco, tea, fruits, and vegetables reportedly increased in 1975. Raw sugar output was estimated at 2.5 million tons.

Livestock numbers rose in 1975, particularly those of hogs and poultry. Collectivization of hog production continued to be stressed.

The largest agricultural conference of recent years, the National Conference on Learning from Tachai in Agriculture, was held during the fall of 1975 and was followed by provincial and local conferences to popularize the policies adopted by the Conference. Two basic goals were set. The first is to transform one-third of the nation's counties into Tachai-type counties by 1980. In this process of agricultural development, counties are to emulate the progress made by the Tachai Brigade and by Hsiyang County in Shansi

Province, two units designated by Mao Tse-tung as models for development. The second major goal is to achieve "basic mechanization" of agriculture by 1980. Mechanization was identified as the second basic stage of the socialist transformation of agriculture, equal in importance to the first stage of collectivization.

Efforts were made in 1975 to further increase agricultural input supplies. Production increases were claimed for all types of agricultural machinery, but the highest priority appears to have been given to irrigation and drainage equipment, followed by tractors, especially hand-tractors, tractor attachments, and diesel engines.

Farmland capital construction and water control activities were also pushed. A record 4 million hectares of land reportedly received new or improved irrigation facilities between the fall of 1974 and the spring of 1975. Total irrigated area reached an estimated 40 to 45 million hectares in 1975, with the greatest growth occurring in northern China.

Chemical fertilizer production in 1975 rose an estimated 20 percent to 6.1 million tons (nutrient weight). Total consumption (production plus imports) reached about 7.3 million tons, 18 percent above the 1974 level, but, because of a drop in consumption in 1974, only 12 percent above the 1973 level. Consumption is estimated to have consisted of 5 million tons of nitrogen, 2 million tons of phosphorous, and 300,000 tons of potassium. Fertilizer imports rose somewhat in 1975, but remained almost 20 percent below 1973 levels. It is probable that the installation of several new modern chemical fertilizer plants will be completed in 1976. Their impact on the PRC's fertilizer production and imports will be significant.

Total PRC exports in 1975 rose slightly to \$6.8 billion, while imports dropped slightly to \$7.2 billion. The trade deficit of \$400 million was a considerable improvement over the nearly \$1-billion deficit of 1974. Efforts to restrain imports were evident in 1975, particularly for agricultural products, and are expected to continue during 1976. Exports should rise somewhat, however.

Grain imports in 1975 dropped to 3.4 million tons--roughly half the 1974 level--and all were wheat, as corn imports ceased. Soybean imports ended in 1975 and the PRC resumed its traditional net export position. Cotton imports were down sharply because of the balance-of-payments pressures and a sharp drop in world demand for PRC textiles. Demand for the PRC's leading agricultural export, rice, fell off because of improved world production. Exports (excluding those to nonreporting countries) were down nearly 20 percent to 1.6 million tons.

U.S. agricultural exports to China dropped 88 percent to \$79.7 million in 1975. Cotton was the only significant export, and the 265,000 bales shipped in 1975 were only one-third of the 1974 level. U.S. agricultural imports from China rose 6.8 percent to \$28.2 million.



\* \* \* \*

With modest progress in the industrial sector, 1975 national income in the Mongolian People's Republic rose 6.2 percent as compared with the planned 5.9 percent. However, Mongolia's agriculture stagnated. Livestock production, accounting for about 60 percent of national income, failed to meet the 1975 target. Because of harsh April weather and simple neglect, the increase of young livestock in 1975 was 8.69 million head, about 300,000 head short of target and 120,000 head less than in 1974. Grain production in 1975 was about 549,000 tons, substantially larger than the poor 1974 crop.

Mongolia trades mainly with the Soviet Union (80 percent) and other members of the Council for Mutual Economic Assistance (15.5 percent). In 1975, the United States again imported more than \$1 million worth of cashmere and camel hair from Mongolia, while there were no U.S. agricultural exports to that country.

Plans for 1976 call for growth in livestock, expansion of cropland, and a 4.3-percent increase in agricultural production.

\* \* \* \*

The period of economic rehabilitation of North Vietnam's economy ended in 1975. By the end of the year, the productive capacity of much of the industrial sector was reported to be above pre-war (1965) levels. A 10-percent increase in national income was reported for 1975, and industrial production was claimed to have increased by 17 percent. A new 5-year plan began in 1976 and included both North and South Vietnam.

Agricultural performance in 1975 was mixed, with crop production dropping somewhat and livestock production increasing. Production of rice, the major crop, is estimated to have been 4.52 million tons in 1975, 7 percent below 1974 production. This drop resulted from bad weather which hurt both the early and late rice crops. The weather also affected production of other food crops (corn, beans, sweet potatoes, and manioc). Oilseeds, soybeans, and other industrial crops also appear to have declined during 1975. The livestock situation improved, and a 16.7-percent increase in the total value of livestock production was reported for the year.

\* \* \* \*

North Korea's economy and agriculture in 1975 did not progress at the same fast rate as in 1974. Grain production, at 7.7 million tons, was a record, but below the target of 8 million tons. Output rose only 10 percent in 1975 in contrast to a 30-percent increase claimed for 1974.

Gains in rice and corn production (3.7 million and 2.7 million tons, respectively) reflected slightly increased acreage and higher yields due to larger application of chemical fertilizer and other agricultural inputs. Barley, wheat, and other minor crops contributed only a minuscule proportion of total grain. Production of industrial crops was up in 1975, and notable increases in vegetable and fruit production were claimed.

Little information was reported on livestock during 1975. There was no major change in agricultural policy. Emphasis was still placed on irrigation, mechanization, electrification, and fertilization.

In 1975, North Korea had trade relations with 120 countries, of which about half were non-Communist countries. North Korean imports in 1974 amounted to \$1.3 billion, while exports totaled \$685 million.

The outlook for North Korean agriculture in 1976 is clouded. There is no challenging goal set for agricultural production. The target for 1976 grain production is again only 8 million tons. Weather in 1976 so far, as in 1975, has been dry and cold in most of the crop areas.

# **THE AGRICULTURAL SITUATION IN THE PEOPLE'S REPUBLIC OF CHINA AND OTHER COMMUNIST ASIAN COUNTRIES:**

## **Review of 1975 and Outlook for 1976**

### **PEOPLE'S REPUBLIC OF CHINA**

With more than 80 percent of the population engaged in the rural sector, agriculture is regarded by the Government of the People's Republic of China (PRC) as the foundation of the national economy. Good agricultural performance is essential to providing food for the population, necessary inputs for the growth of industry, and exports to finance the imports required for modernization of the nation.

The PRC's agricultural problems are age-old: limited arable land, a large population, largely untapped natural resources, and a developing economy.

To increase agricultural output, especially grain production, China must strive for greater productivity from its labor, land, and other resources.

Economic policies of the past 5 years indicate that the Government recognizes the scope and severity of the agricultural problems. Concerted efforts are being made to implement policies and programs for rural structure and organization, farm production and procurements, tax collection, incentives, input allocation and agricultural research.

### **AGRICULTURAL PRODUCTION**

Agriculture in the People's Republic of China had a successful, but not outstanding, year in 1975. Production of most crops, output of the livestock sector, and sideline activities registered increases of varying amounts, closing the fourth 5-year plan on a positive note for agriculture. However, examination of official reports on agriculture's performance in 1975 and for the previous 4 years indicates that not all goals stated or implied were attained.

Claims were made that additional Provinces became self-sufficient in grain production in 1975 and that the annual grain procurement was completed much ahead of schedule. Nevertheless, China's agriculture is not expanding at the planned rate. Production of grain, the food staple, registered an average



annual increase of less than 2.5 percent over the fourth 5-year plan period, rising from 240 million tons in 1970 to an estimated 270 million tons in 1975. 1/

### Crop Production

In 1975, crop production rose less than in 1973 and 1974. Estimated grain production was up less than 2 percent, largely because of unfavorable weather, which lessened the effects of increased inputs, especially chemical fertilizer, irrigation, insecticides, and improved seeds. Except for cotton, which suffered a setback, most other crops registered small to moderate gains.

### Grains

Total grain production--Unlike the past 4 years, when official statements provided specific figures for grain production, the official claim in 1975 was for a crop larger than the record harvest in 1974. The official assesement as reported by NCNA was that:

The harvest this year was a good one. The total grain output for the whole country showed a noteworthy increase over last year, itself a good year, and set a new record--20 Provinces, Municipalities, and Autonomous Regions won good harvests this year, with total grain output in half of the country hitting an all-time high.

This year, certain areas in China were hit by the severest natural adversities of the last few years, including drought, low temperatures, sustained drizzle, insect pests, and floods.

Reports for 18 of the 29 Province-level units claimed increases over 1974. 2/ In addition, Hopeh Province claimed to have equaled the 1974 output despite suffering the worst drought in 50 years. Ten Provinces made no reports on the grain harvest, and one report made reference to "a few stricken areas where output was the same or slightly lower than in 1974" (app. table 1).

Based on the provincial claims for grains and other crops, it is estimated that total grain production, excluding soybeans, increased approximately 5

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1/ These figures do not include soybeans. In this report, soybeans are treated separately from grains, although some PRC officials include soybeans in their 1974-75 total grain estimates.

2/ A Province-level unit herein refers to Provinces (there are 21), Municipalities (3), and Autonomous Regions (5).



million tons in 1975, or to about 270 million tons. <sup>3/</sup> (See appendix table 2 for USDA revised estimates of PRC's total grain, 1949-75.) Estimates for grain production for 1971-75 are as follows:

Year	Total	Rice	Wheat	Miscellaneous grains	Tubers (grain equivalent)
<u>Million metric tons</u>					
1971	246.0	112.6	30.7	76.4	26.3
1972	240.0	109.4	35.9	68.3	26.4
1973	250.0	113.0	34.4	75.2	27.4
1974 <sup>1/</sup>	265.0	120.0	37.0	79.6	28.4
1975	270.0	122.0	38.7	80.4	28.9

<sup>1/</sup> ERS has revised the total grain production estimate for 1974 upward to 265 million tons. This revised estimate is based on the late Premier Chou En-lai's statement, at the Fourth National People's Congress on January 13, 1975, that the total grain production in 1974 had increased 140 percent over the 1949 level. Last year, ERS adopted the PRC officially claimed production estimates for grains and other major crops, including the PRC series dating back to 1949. (For a discussion of this, see the appendix to *The Agricultural Situation in the People's Republic of China and Other Communist Asian Countries, Review of 1974 and Outlook for 1975*, Econ. Res. Serv., U.S. Dept. of Agr., Foreign Agr. Econ. Rpt. No. 111, Sept. 1975. The ERS estimates appearing in the tabulations on pp. 1 and 3 of that report have thus been abandoned, and the revised estimates, appearing on p. 29, have been adopted.)

Early harvested grains--China's early harvested grains, comprising about 40 percent of total grain production, set another record for production in 1975. <sup>4/</sup> Winter wheat and early rice, the major early grain crops, accounted for the gain, with wheat registering the greater increase. Minor grains--such as barley, pulses, and rye--also fared well. In all, 19 of the 24 Province-level units that grow winter crops claimed an increase. Only three provinces

<sup>3/</sup> Vice Minister of Agriculture Yang Li-kung announced at the 18th UN-FAO Conference in Rome, Nov. 1975, that China's total grain harvest in 1974 was 274.9 million tons. A thorough search of official literature does not include this figure nor has it been broadcast officially by NCNA. This figure is close to the sum of USDA estimates of grain and soybean production.

<sup>4/</sup> The early harvest, also referred to as the summer grain harvest, includes crops harvested from the first of the year to the beginning of autumn on the lunar calendar. According to information from the Chinese Academy of Agriculture Science, the beginning of autumn on the lunar calendar is roughly August 8 on the western calendar. The crops are winter crops (winter wheat, rapeseed, barley, rye, pulses, sweet potatoes, and early corn), various fast-maturing catch crops planted in the early spring and harvested in early to midsummer, spring wheat, and early rice.

claimed that distinction in 1974. Production of winter crops was substantially less in 1973 than in 1974 and 1975.

Of the winter-planted grain crops, wheat (accounting for about 87 percent of total wheat) occupies the largest acreage, about two-thirds of the area planted. Barley and pulses comprise most of the remainder.

A small portion of total sweet potatoes and corn, which are also among the winter-planted crops, are grown in the extreme south and are harvested and cleared from the fields in time for the preparation of seedbeds and planting of the early rice crop.

Favorable weather conditions contributed to a record early harvest in the North China Plain, China's winter wheat belt. This helped to offset some losses of grain crops in Central and South China, where large areas suffered from extended periods of damp, rainy, and cool weather during much of the spring of 1975.

Area planted to winter crops expanded only slightly in 1975, possibly because of an extended rainy period in the North China Plain at planting time (in the fall of 1974). Although a report at planting time stated that total sown area of winter wheat increased about 400,000 hectares, a later report put the increase in acreage planted to all winter crops at 133,000 hectares. The higher figure likely was not attained because of shifts in the winter cropping areas in South China, where food grain areas apparently were not planted on time and were planted to green manure crops and other fast-maturing catch crops.

Production of spring wheat, about 13 percent of total wheat, increased somewhat in 1975. An increase of 20 percent was claimed in Liaoning Province. Kirin and Heilungkiang Provinces, two other important spring wheat areas, had a good crop despite problems with drought during much of the growing season, especially during the latter part.

Early rice production was also hailed as setting a record in 1975. The conditions under which it was grown and the lack of firm figures to support the claim, however, suggest that production was only marginally better than in 1974. Of the 13 early rice producing Provinces, only 6 claimed increases, but most of these claims came from smaller producers to the north. The largest producing Province, Kwangtung, reported no specific increase, making only the general claim of a bumper crop. Major problems affecting early rice production included weather and insect infestation. Large areas of South and Central China experienced cloudy skies, drizzle, and cool weather, which retarded growth and caused some seedlings to rot in the early stages of growth. The effects of a slight increase in acreage in 1975 were partially offset by lower yields, keeping the increase in early rice production to a minimum.

Official evidence of the record early grain harvest was the announcement that the state plan for total summer grain deliveries and purchases had been completed by August 2, and that procurements exceeded those in 1974. This delivery date probably is also a record.



Late harvested grain--As in 1973 and 1974, weather limited the output of the late grain harvest in 1975. This harvest (including intermediate and late rice, corn, sorghum, millet, oats, and potatoes reduced to a grain equivalent) constitutes about 60 percent of China's total grain. Only one late harvested crop, rice, was claimed to have exceeded the 1974 crop by about 10 percent. Despite the disappointing overall harvest, a record was set both in the amount and the time of state grain procurements, which were reportedly completed on January 8, 1976, almost 3 months ahead of the final date (March 31, 1976) for grain procurement. All of the Provinces that claimed a 10-percent increase in grain output in 1975 were those with a large percentage of early harvested grains. Most of the other Provinces showing an increase also were those with a preponderance of summer harvested grains.

The late harvested grains were adversely affected by unusual weather patterns from the first of August through November. Most of these adversities occurred during both the crops' development and the harvesting season. Rainfall was below normal from June through August in major grain producing areas in North China. Hopeh Province claimed the drought was the worst in 50 years. Following the dry spell, heavy rains fell over much of North China in early August in time to help some crops. Heavy rains at harvest time, in September and October, caused flooding and interfered with the harvest, drying and storage of grain. Torrential rains in Central and East China also struck in early August, causing flooding and waterlogging in parts of the Yangtze River Basin. In September and October, these areas were again hit by heavy rains, which hampered harvesting and threshing. Two large typhoons struck the ripening late rice crop in South China in October, causing lodging and shattering. In addition to the persistent bad weather, the late harvested crops suffered from an increase in insect infestation. Shantung Province was the only Province in North China to claim an increase in total grain production in 1975.

### Industrial and Other Crops

Production of China's vast variety of industrial (commercial) crops in 1975 was only slightly larger than in 1974. Only rapeseed was singled out for outstanding production. Cotton, the major industrial crop, was cited for increases in production in the first harvest report, but was downgraded to a good harvest in later reports. This is interpreted as a definite drop in production.

Based on previous estimates, 1975 is the second year in a row in which cotton production had declined (app. table 3). <sup>5/</sup> The reduction, estimated to be about 4 percent, resulted from the unfavorable weather in North, Central, and East China during the second half of 1975. Even so, the production in 1975, although disappointing, was still at or above the average for 1970-74 (2.3 million tons) and is tentatively estimated to be 2.4 million tons.

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<sup>5/</sup> The 1974 production estimate was revised downward following additional information indicating that 1974 production of cotton was less than in 1973.

Efforts to increase cotton production continued to be directed toward increasing yields through improvement of seed strains, technology, increased chemical fertilizer application, and increased use of more intensive methods of cultivation. Very little, if any, acreage expansion has been noted. To maintain domestic textile consumption and push textile exports, increased attention has been given in recent years to the installment of additional facilities to produce artificial and manmade fibers. This has been accompanied by less hesitation to import cotton in case of crop shortages, indicating more clearly the PRC's search for alternative methods of supplying the country's textile needs.

Following a record production of bast fibers in 1974, references to the production of flax and jute indicated only that an increase had occurred in these crops in 1975, implying a slight increase over 1974 levels.

Although no specific reference was made to soybean production in 1975, or for that matter, in any of the past several years, it is believed that production increased somewhat in 1975, and that this fits a trend of rapidly rising production over the past few years. Soybean acreage and production was reduced substantially in the early 1960's, creating a much larger need for increased output in recent years. Special emphasis on soybean production probably began in 1971, following policy statements encouraging the increased production of crops other than grains.

It is believed that since 1971 considerable Government direction and support has resulted in increasing the output of this crop, primarily for domestic consumption. The crop is very versatile. It can be grown on the poorest cropland (which otherwise may be wasted), along roadsides, on ditch banks, etc. It is especially adaptable to intercropping on better cropland with grains, for instance sorghum and corn. Exports of soybeans were below average for 1973/74, but increased to near average in 1975, an indication of improvement in the production of that crop.

Based on fragmentary information, USDA has revised the estimated area and production of soybeans in the PRC to reflect a rapid increase since 1971. The drought in North China in 1972 restricted production, despite an increase in acreage. Since then, it is believed that both acreage and production have increased. Numerous improvements in cultural practices, breeding, and technological developments--noted by visiting Western scientists--appear to have increased yields considerably. Thus, an estimated increase of about 45 percent in the production of soybeans since 1970, to an estimated 10 million tons, resulted from a 15-percent increase in acreage and a 25-percent increase in yields (see app. table 4 for the revised series).

Production of most of China's major vegetable oilseeds (rapeseed, peanuts, cottonseed, and sesame) increased again in 1975, with rapeseed exceeding the 1974 output by a large margin. Output of rapeseed, the leading source of cooking oil, has increased substantially since 1971. Although previously confined primarily to the southern portion of China as a winter crop, acreage has been expanded as far as Liaoning Province. In the northern and western areas, it is grown as a summer crop.





Production of sugar crops (sugarcane and sugarbeets) rose only slightly in 1975. Drought in the north kept sugarbeet yields down, despite considerable planting on irrigated land. Sugar cane in the southern areas experienced both dry and wet periods during the growing season. The powerful typhoons which struck South China at harvest time probably reduced yields in some areas of Kwangtung Province, and some acreage may have been destroyed. It is probable that both acreage and production continued to increase in the Kwangsi-Chuang Autonomous Region, resulting in a small increase over 1974 in the total national crop. Numerous official statements in 1974 indicate that sugar production from beet and cane increased from about 1.8 million tons (refined equivalent) in 1971/72 to slightly over 2.2 million tons in 1974. An estimated increase of 5 percent in 1975 would place the production at about 2.32 million tons (refined basis), or 2.5 million tons of raw sugar. 6/

### Livestock

Following 2 years (1973-74) in which there were very few official reports on the livestock sector, a virtual deluge of reports was issued in 1975. However, China's year-end report, stating that "new progress was made in... animal husbandry..." in 1975, did not mention some of the most significant developments in the livestock sector during the year. All categories of livestock increased during 1975. The PRC stressed the policy of collectivized raising of livestock more than in any year since the Great Leap Forward. Essentially all the effort to collectivize the livestock sector was directed at hogs and poultry. There is no indication as to what proportion of hog and poultry raising has been collectivized, but it is considerably greater than the 10 percent of a few years ago. However, collectivization has not been pushed to the exclusion of private ownership and production. Peasants are encouraged to increase their own production of hogs, but the trend is toward production team, brigade, and commune raising and ownership.

Fragmentary reports indicate that the shift to collective hog farms has not been consistent. Hunan Province claimed that 70 percent of the production teams had set up collective piggeries. In Kwangsi-Chuang Autonomous Region claims from Wuchou Prefecture showed that over 90 percent of the production teams had established collective piggeries. Kwangtung Province, with one of the lowest proportions of hogs in the collective sector, had only a 15-percent increase in the number of hogs in piggeries in 1975, but claimed a 56-percent increase in the number of hogs under collective management.

Although a goal of "one hog per mou" (of cultivated land), or "one hog per person" has been indicated, no target date has been announced, nor has the target date for total collectivization of hogs. Officials point out that the manure produced by one hog adds significantly to fulfilling the fertilizer requirements for a mou of cropland. The value of hog manure in increasing crop production has been the overriding factor in the push to expand hog numbers.

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6/ The conversion factor from refined to raw sugar is 1.078.



The persistent emphasis on increasing hog numbers since the agricultural depression of 1959-61 has resulted in the policy of accepting lighter hogs for slaughter. Prior to the Great Leap Forward period, the standard minimum weight for hogs sold to the state was 100 kilograms. Various sources indicate that in the 1960's the figure was reduced to about 55 kilograms, and that so far in the 1970's, the weight averages about 70 kilograms. This is the average weight that can be attained by a hog in China in 10 to 12 months. In October 1975, Canton radio stated that the average weight per hog sold to the state in Kwangtung Province from January to August was 70 kilograms. This was the highest average weight of hogs delivered to the state during the past 11 years. One analysis of hogs received from the PRC by Hong Kong buyers in the summer of 1975 showed that the average weight of hogs was 75-80 kilograms liveweight.

There are no reliable figures on hog numbers in China. Reports alluding to the number of hogs in mid-1975 suggest that either the official report on hogs in 1973 was incorrect or that there has been a decline in hog numbers following the drought in 1972. The 1973 report claimed that in mid-1972, hog numbers were 4.5-fold above the 57,752,000 of 1949. In late 1975, a number of official reports made reference to mid-1975 hog numbers. Increases over the 1949 level ranged from 300 to 400 percent. Kwangtung Province admitted a decline in hog numbers in 1973-74. Whether this was the case for the entire country cannot be determined at this time.

At face value, the 1973 claim gives a total of 260 million hogs in mid-1972, and the 1975 claim shows that by mid-1975 China had slightly over 230 million hogs. The 1973 report claimed that more than 800 counties had "hit the target of two to three hogs per peasant family" set in the National Agricultural Development Program (NADP). The 1975 report claimed that more than 700 counties had reached the target and defined the goal as "an average of two and a half raised per household." The goal in the original draft was "two and one-half to three hogs raised per household." The distortion in the phraseology in the two reports and the massive program to collectivize pig production in 1975 (with renewed emphasis at the National Conference on Learning from Tachai in Agriculture in September 1975) suggest that hog production in China may have declined or at least remained static during 1973-74. (Marion B. Larsen)

#### AGRICULTURAL POLICY

The central theme of the PRC's general economic policy in 1975 was a continuation of self-reliance and promotion of diversified national economic development. The priority order continued to be agriculture, light industry, and heavy industry with "agriculture as the foundation." Article 7 of the revised Constitution, as adopted by the Fourth National People's Congress in January 1975 reaffirmed continuing the basic agricultural organization of three-level ownership--that is, "ownership by the commune, production brigade, and the production team, with the last as the basic accounting unit." Therefore, the commune still serves as the basic level unit to integrate Government administration and economic management, while the production team serves as the lowest unit for production, distribution, and ownership. However, the longrun goal appears to gradually downgrade the role of the production team in favor of increased authority for the brigade and commune.

Within the context of "taking agriculture as the foundation," the PRC follows the policy of "taking grain as the key link and ensuring an all-round development." Based on the "Eight-Point Charter" for agricultural development, as formulated in 1958, all levels of planning are to give priority to grain in allocating land, manpower, and inputs to agriculture. 7/ A necessary level of production in industrial crops, forestry, animal husbandry, and other agricultural enterprises is to be maintained to ensure a diversified economy, adequate food supplies, raw materials for industry, and greater export earnings.

Communes and farmers again were encouraged through conferences and directives in 1975 to increase hog production. Great emphasis was given not only to the need for providing more pork and hog products, but also to supplying more manure for crop production. Greater stress in 1975 than ever was placed on producing more hogs on a collective basis, both in rural and urban-industrial areas. Expansion of hog production also emerged as one of the topics in the National Conference on Learning from Tachai in Agriculture.

To motivate peasants into increasing farm production, the Government continued to employ nonmaterial and material incentives. Numerous conferences were held, and frequent editorials and directives were issued by all levels of administrative units to exhort the masses to work harder for the people and to suppress capitalistic tendencies for personal gains.

For material incentive, private plots and private production activities were officially sanctioned in Article 7 of the revised Constitution, which stipulates: "Provided that the development and absolute predominance of the collective economy of the people's commune are ensured, people's commune members may farm small plots for their personal needs, engage in limited household sideline production, and in pastoral areas, keep a small number of livestock for their personal needs." Farm households on these private plots produce minor crops, such as vegetables and fruits, and raise poultry and livestock for personal consumption or for sale.

The Government also provided production incentives by keeping the agricultural tax low, as in recent years, by maintaining the tax at a fixed amount derived as a percentage of production in a selected base year. This amount of tax stays fixed in the ensuing years regardless of the size of increase in production. Although the base has been revised periodically, the agricultural tax was reduced from 12 percent of total farm output in 1952 to 5 percent in 1975.

To further enhance farm production, the Government continued to allocate state appropriations and extend bank loans to improve farmland, to construct water conservancy projects and to finance other rural capital construction projects. In 1975, such appropriations and bank loans increased 9 and 20 times, respectively, over the levels of the early 1950's, according to a

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7/ For details on farmland improvement, water conservancy, farm mechanization, fertilizer, and seed improvement, see the section on Agricultural Inputs.



New China News Agency report. It was also reported that to increase production incentives, Government practices included raising purchase prices for farm products (to double the levels of 1950) and lowering selling prices (to one-third to two-thirds below those of 1950) of fertilizer, insecticides, farm machines, fuels, and other means of production.

The campaign of sending youths to the rural areas continued in 1975. Since 1968, a total of 12 million educated youth have been dispatched to the country, according to a 1975 report. They provided additional manual labor in the field as well as manpower in various services at the commune and brigade levels.

The PRC's foreign trade policy in 1975 continued to stress independence, self-reliance and balanced trade. The Government recognizes, however, the necessity of importing much needed modern technology, raw materials and agricultural products, and exporting raw materials and industrial and agricultural products for foreign exchange. While still barring long-term credit and joint ventures, the PRC in recent years has been more willing to accept deferred payments and short- to medium-term credit arrangements. 8/

#### Fourth 5-Year Plan

The fourth 5-year plan which ended in 1975, was characterized by a moderate economic policy in which there was great emphasis on increasing grain production by large investments in farmland improvement, water control and use, fertilizer production and imports, and seed improvement. All these investments were aimed at reducing the adverse effect of unfavorable weather on crop production. The PRC did not report specific targets for the fourth 5-year plan, and there have been very few specific reports of plan achievements. However, PRC grain production set records in 1971 and in 1973-75, despite less than favorable weather in 1974 and 1975. Based on USDA estimates, grain production increased from 246 million tons in 1971 to 270 million tons in 1975, a cumulative rise of about 10 percent, which kept pace with population growth. 9/ Travelers' reports of an ample food supply and the sharp reduction of wheat imports by the PRC could be attributed to the 5-year plan's success.

In the Northern Agricultural Conference in 1970, Hsiyang County, Shansi Province, was designated as the Tachai model for agricultural development. The PRC press reported in 1975 that 300 counties in China had attained this level, an achievement for the fourth 5-year plan. Another possible criterion for achievement, the grain yield targets set in 1956 in the National Agricultural Development Program, were used again in 1975 as a measure for progress in agriculture. A total of 725 counties was reported to have surpassed these targets. 10/

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8/ For details, see the section on Foreign Trade.

9/ This includes the setback in PRC grain production in 1972 when adverse weather resulted in a 2.4-percent reduction in total grain production from the 1971 level. For details, see the section on Crop Production.

10/ For details, see the section on Agricultural Development: Tachai Model.

## Fifth 5-Year Plan

Looking toward the fifth 5-year plan (1976-80), the late Premier Chou En-lai set the tone for future development at the Fourth National People's Congress. He outlined the two stages of national economic development that began with the third 5-year plan: "The first stage is to build an independent and relatively comprehensive industrial and economic system in 15 years, that is, before 1980; the second stage is to accomplish the comprehensive modernization of agriculture, industry, national defense, and science and technology, before the end of the century."

The National Conference on Learning from Tachai in Agriculture was convened in September 1975. It extended the first stage of national economic development to include transformation of one-third of the counties (from 300 counties at the present to 700) into the Tachai type, and basically to mechanize the nation's agriculture by 1980. To achieve this, further consolidation of the collective structure by the Central Government in planning, administration, and coordination is expected. As part of this, the Province has been designated as the key unit for the mechanization of agriculture.

PRC agricultural policy, rural planning and farm activities were in general unaffected by the political campaigns during 1975. The death of Premier Chou in January 1976 and the changing of leadership in April do not appear to have affected the emphasis on agriculture at all levels. Of course, further progress in agriculture will hinge on the continuation of both the direction and speed of economic and agricultural policies undertaken since the Cultural Revolution. (Charles Y. Liu)

### AGRICULTURAL DEVELOPMENT: TACHAI MODEL

The National Conference on Learning from Tachai in Agriculture, held September 15-October 19, 1975, set the PRC's agricultural development policies for the future. It was followed by nationwide provincial, prefectural, and local conferences to popularize the policies suggested by the conference. Two distinct, yet overlapping, campaigns to achieve agricultural development emanated from the conference: (1) transform one-third of the nation's counties into the Tachai type, and (2) basically mechanize agriculture by 1980. As in the past, the Tachai Brigade is being used as a symbol for national agricultural development policies. The final step of both past and present policies is mechanization of agriculture. The current Tachai type symbolizes beginning mechanization.

Earlier development programs called for certain other steps to be taken before mechanization. The intervening steps have not been eliminated in the current program, just gathered together in a third, simultaneous, but slightly less emphasized campaign for improved "scientific practices" in agriculture.



The eventual goal of all agricultural development programs has always been gradual reorganization from the system of ownership by collectives to the communist ideal of ownership by the people--that is, the state. The present Tachai and mechanization campaigns are not exceptions. The immediate target of the Tachai campaign is for a "majority or near majority" of the counties to quickly become advanced Tachai types in order to establish the necessary foundation for a modern nation.

As a policy, mechanization is said to be the second major "revolution"--after collectivization--in agricultural development. The eventual goal is achievement of "Big Socialist Agriculture", upon which the development of modern industry, defense, and science and technology will depend. Because mechanization is dependent upon further consolidation of the collective structure along the pattern of the Tachai Brigade it is another step toward enlarging the level of the basic rural administrative unit.

In the PRC, agricultural mechanization includes tractors, combine/harvesters, plows, transplanters and other paddy machines, and threshers--items which perform the basic farming operations. Unlike most nations, the PRC's concept of mechanization also includes pumpwells, irrigation and drainage equipment, internal combustion generating units, basic processing machinery, farm transportation vehicles, and agriculture-related manufacturing plants. Moreover, the concept of mechanization is firmly linked with the concept of developing Tachai-type counties. That development process creates the larger, flatter fields and establishes the necessary technological base (including maintenance, spare parts, and operators) that are prerequisites for mechanized farming.

Thus, the Tachai campaign symbolizes the means for achieving a new stage of national agricultural development. That new stage, basic national mechanization by 1980, is but another step in the overall step-by-step process from which the foundation for a more modern nation will be built.

### The Tachai Model

Counties advanced in agricultural development are called Tachai type on the basis of experiences of the Tachai Brigade of Hsiyang County, Shansi Province, during two decades of planned development. In its first development decade (1953-63), the Tachai Brigade planned and achieved initial successes based almost entirely on its own initiatives and a political spirit that is credited with its persistence despite discouraging setbacks and marginal farming conditions. For this reason, a 1964 national campaign to "Learn from Tachai" correlated the Tachai Brigade's successes with the pattern for agricultural development presented a few years earlier by the Eight-Point Charter and the National Agricultural Development Program, thus, broadening the scope of the Tachai model. The 1964 campaign encouraged all brigades and

communes in the nation to emulate the planning, political activism, and production results proposed by those plans and achieved by Tachai in its first decade of development. 11/

In 1970, Hsiyang County, on its own initiative, became the first county in the nation to satisfactorily emulate the Tachai Brigade model. As a result, the last major agricultural policy conference, the Northern Agricultural Conference held in 1970, called for counties to emulate Hsiyang County and strive to become "Tachai-type counties". Meanwhile, the Tachai Brigade progressed to a new level by the end of the second development decade (1964-74), "basically completing" the Eight-Point Charter and moving into agricultural mechanization and diversified activities such as orchard cultivation, livestock raising, food processing, and manufacture of fertilizer, cement, and agriculture machinery.

Although the original scope of the National Agricultural Development Program, the Eight-Point Charter, and the campaign to "Learn from Tachai" may have been defined in rather narrow and oversimplified terms as articulated in popular slogans, the present reinterpretation is broad in scope, making the three plans all a part of an ideal concept for national agricultural progress. Thus, the current explanation of what Tachai-type counties should be includes a total rural development program of which Tachai is but a symbol.

The 1975 conference announced six general criteria for a Tachai-type county. If these six criteria are combined with the reported achievements of Hsiyang County and other model counties being held up for emulation, the following more specific picture of the "advanced Tachai-type county" emerges.

Points one through three outline the ideals of political activism upon which the Communist rural organization is to be based. County party cadres are urged to lead the populace--both by example and through education--in implementing the correct party policies. Specifically, each one-third of the county cadres are to work in agricultural development efforts at local administrative levels during 100 days of each year. Although 100 days' labor is recommended, 70 days is the minimum requirement for county cadre participation.

A long-range plan, covering about 10 years, is to be devised, specifying implementation targets for the NADP goals that the county proposes to meet. The long-range plan should be designed to facilitate reaching Tachai-type development within a suggested range of 2 to 3 years, although past efforts

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11/ NADP grain yield targets are 3 tons per hectare north of the Yellow River and in Tibet, 3.75 tons per hectare between the Huai and Yellow Rivers, and 6 tons per hectare south of the Huai River; hog targets originally were 2.5 to 3 head per household; and cotton yield targets were .3, .45, .6, or .75 tons per hectare depending on local conditions. NADP goals were summarized into eight popular points: (1) soil improvement, (2) fertilization, (3) water control, (4) improved seed technology, (5) maximization of multiple cropping and inter-planting, (6) plant protection, (7) field management, and (8) mechanization.



have generally taken slightly longer. As was true in Mao's land reform plans at the end of World War II, the communes in a county are to be transformed by thirds, beginning with the most backward third. A more advanced unit, however, should be selected to become a model leading the county. In this manner, the targets set in points four through six are to be implemented.

4. "Rapid progress" and "substantial results" should be achieved in all agricultural sectors. Specific targets seem to include: approximately 50 percent of the communes in the county advanced, 50 to 90 percent of the farmland adequately irrigated and drained, a minimum of 70 to 75 percent of the farmland high- and stable-yielding, mechanization of up to 70 percent of all the county's operations, and optimum extension of the multiple-cropped area.

5. Steady growth of average incomes and average outputs first of grain, and then of crops such as cotton and oilseeds, is to occur in the poor communes and brigades of the county. This growth should result in average incomes and outputs equal to or greater than present intermediate levels in the county. The growth should also enable the county to reach or surpass the following targets, in the order listed:

- self-sufficiency in grain production;
- surplus grain for sale to the state in increasing amounts;
- annual grain production increases despite natural disasters;
- grain yields equal to the NADP targets for the area in which the county is located (see footnote 11);
- per capita grain yields reaching a specific target;
- cotton yields equal to the local NADP cotton targets;
- hog production initially equal to the NADP target, followed by reaching the targets of one hog per person or one hog per mou;
- exceeding other higher NADP grain yield targets; 12/
- grain yields reaching and surpassing the Tachai Brigade's 1971 achievement of 7.5 tons per hectare, or, in the south, doubling of grain yields, and cotton yields in cotton areas surpassing 1 ton per hectare.

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12/ For example, a county in the North, where the target is 3 tons per hectare, is to exceed the target of 3.75 tons per hectare for central areas.

6. Comprehensive development of agriculture is to be achieved, including increased outputs which surpass the NADP targets for forestry, animal husbandry, sideline occupations, and fishery. Increased contributions to the state should also be achieved from these sectors. About 85 percent or more of the public accumulation funds of the county should be reinvested in further local agricultural development. Of course, counties producing mainly forestry or livestock are expected to achieve more in their areas of specialization, while also meeting the minimum requirements in grain and other sectors before being called "advanced".

#### Progress to Date

At the end of 1975, the nation reported that 300 counties had advanced to approximately the same level as Hsiyang County. Each of these counties, at least one per Province, had first undertaken "farmland capital construction". This effort included embanking, leveling, and reclaiming land; increased use of organic fertilizer and construction of simple fertilizer plants; and digging of ditches, canals, wells, and reservoirs to improve irrigation. In each case, both yield and production increases have resulted. Also, accumulated funds have increased sufficiently to finance further development, such as mechanization, and to permit following the nationally recommended goal of using the funds to promote the development of more backward neighboring brigades and communes so as to raise not only the level of the county but also the level of the prefecture, province, and the nation closer to meeting the qualifications for "advanced" status.

The Tachai Conference called upon the 300 already advanced counties and 400 or more additional counties (a total equal to one-third of the nation's counties) to become advanced or further advanced by keeping up with Tachai Brigade's ever-advancing level of development. The PRC reported that 725 counties exceeded their NADP grain yield targets in 1975, indicating that a sufficient number of counties have already progressed halfway through point five in implementation of the six points for agricultural development. If these 725 counties continue to progress, then the goal of one-third of the counties being of Tachai type could be met.

Examination of provincial planning statements reveals that each province and prefecture, like the counties, is to make its own long-range plan for agricultural development and decide for itself the timing and practical steps required each year to reach the 5-year goal of "basic mechanization". Moreover, it appears that the nation has decided which Provinces, and the Provinces have decided which of its prefectures and counties, will be developed each year. In each case, numbers and even names of units to reach advanced status by 1980 have been specified.

Based on recent achievements and future plans, it appears that development priority has been given to the entire eastern region, half to two-thirds of the southeastern, central, and northern regions, and one-third of the northeast and northwest regions (see table 3). The southwestern region



apparently will be last in the development process. These priorities not only extend the Tachai-type idea of balanced development by thirds to a national level, but also, as claimed, give priority to the Provinces with larger and higher yielding crop areas. Several major crop producing Provinces--for instance, Szechwan, a major rice area--have so far been omitted.

The PRC has claimed that five Provinces have already exceeded their NADP targets and that another 12 Provinces are approaching theirs, which indicates that 17 Provinces could already be working toward achieving advanced status. Hopeh Province reported that at the end of 1975, it was one of several Provinces that had achieved the agricultural development goals symbolized by the Tachai-type county. Available data indicate that only 14 provinces, including Hopeh, have already or plan by 1980 to exceed their NADP goals. <sup>13/</sup> For these Provinces, the degree of success reportedly ranges from a minimum of more than a third of the counties or prefectures exceeding NADP goals, to the entire Province exceeding the goals. In addition to Hopeh, the following six Provinces appear to have made the most progress in meeting or exceeding the NADP portion of the requirements for advanced status: Kwangtung and Kwangsi in the southeastern region; Anhwei, Kiangsu, and Shanghai in the eastern region; and Hunan in the central region. Plans to achieve the NADP goals by 1980 are cited in PRC reports for the other seven Provinces: Chekiang in the east, Hupeh in the central, Kirin in the northeast, Shansi and Shantung in the north, and Shensi and Kansu in the northwest.

That these particular Provinces are progressing at a more rapid pace suggests that rice, winter wheat, miscellaneous grains, and rapeseed, in that order, ought to begin showing larger production increases. A second set of crops, including soybeans, sugar, tea, peanuts, sweet potatoes, cotton, and spring wheat, may also begin to show larger gains as the Tachai-campaign progresses and more counties begin to have improved soil conditions and adequate irrigation, some fertilization and mechanization, and at least a minimal consciousness of the "scientific" approach to agriculture.

### Basic Mechanization

There are three steps for accomplishing agricultural mechanization in the PRC:

(1) Successful completion of farmland capital construction (the Tachai program). (2) Semi-mechanization--that is, use of manually- or animal-powered machines. (3) Complete mechanization--that is, use of all types of tractors and other larger farm machinery.

"Basic mechanization" is assumed to be a level short of "complete" mechanization of the "majority" of the nation, but in which some of the nation may have "completed" mechanization. Assuming that the 725 counties and/or any 10 of the 14 Provinces cited above could reach by 1980 the present

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<sup>13/</sup> Based on 1975 data for prefectures and counties that have surpassed their NADP grain-yield targets and on provincial plans recently published.



agricultural development level symbolized by Tachai, then the goal of the mechanization campaign, "basic national mechanization by 1980," may be synonymous with the goal of one-third of the nation having achieved Tachai-type development.

It is significant that the "key unit for national mechanization of agriculture" will be the Province, not the county. Apparently, the Province will receive greater emphasis than before in its role as a director of county affairs and will have somewhat tighter control over the activities of the county. This increased centralization seems to reflect a new interest in improving the efficiency of industries manufacturing agricultural machinery, especially at the prefectural level but possibly at the county level as well. Perhaps also reflected is the realization that the medium-sized factories at the prefectural and county levels cannot afford to each be complete production units from start to finish if the Provinces are expected to meet high levels of county mechanization in 5 years' time. Since the increased emphasis on Provincial administration seems to be associated with the question of pace, it probably has more connection with politics than most of the basic points of the agricultural development program and therefore could be more variable.

The pattern that will be followed in basic mechanization will vary according to the local farming conditions and crops. In general, as in the Tachai model, small-scale rural industries at the county level and below will still be expected to be self-reliant and manufacture only complete, locally suitable products. (Carolyn L. Whitton)

## AGRICULTURAL INPUTS

### Mechanization

This year's popularization of the national goal of basic mechanization of agriculture by 1980 is an indication of the emphasis that will be placed on this input in the fifth 5-year plan period (1976-80). Mechanization efforts will be based on the progress achieved in the 300 counties already conforming to the Tachai model.

The present effort puts priority on production of mechanized equipment for irrigation, drainage, and water control, on production of hand-tractors, and on production of diesel and other internal combustion engines to run this equipment. Following mechanization of water systems, the PRC seems to be emphasizing (1) mechanization of plowing, (2) processing, (3) threshing, and (4) rice transplanting, in that order. Emphasis on mechanization of these particular labor-intensive operations confirms that the PRC desires to free agricultural labor from post-harvest operations to perform the peak season field operations more expeditiously, and thus to facilitate extension of the multiple-cropping area.

At present, it is claimed that 96 percent of the counties have a farm machine plant of some type and that all but a few communes and brigades have a repair station of their own. If this is so, agricultural mechanization has begun in every part of the nation.

Because of the policy of self-reliant development, however, it is unlikely that mechanization will have much effect on agricultural machinery trade.

### Total Machinery Production

Data reported for the first three quarters of 1975 indicate that compared with a year earlier, the PRC increased its production and supply to the countryside of the 12 major types of farm machines. For 1971-75, production of irrigation and drainage equipment reportedly rose 3.3-fold. Production of combine/harvesters and sowers reportedly registered large increases in the first three quarters of 1975, and production gains were also claimed for threshers, processing machines, plows, and other farm machinery. Unfortunately, data are insufficient to determine total production figures for this equipment, but the PRC has claimed that 1,800 different types of agricultural machinery were produced in 1975.

### Tractor Production

Total tractor production has made gradual progress in recent years. Two claims were made for 1974 tractor production--a 540-percent increase over 1964 and a 500-percent increase over 1965 production. For 1975, it was claimed that tractor production was eight times greater than in 1970. Total tractor production figures for 1975 cannot be derived because of inconsistencies between the PRC claims and the tractor production series compiled by Western sources. The 1971-75 production increases cited in the PRC claims, however, indicate that total tractor production received more emphasis in the development process than did most other types of agricultural equipment.

The PRC expected 1975 output of hand-tractors to be more than 600 percent greater than in 1970. In 1974, hand-tractor production was reported to be 36 times greater than in 1965. Conflicting claims for heavy tractor production in these 2 years make it impossible to derive the proportion of each in total tractor production. <sup>14/</sup> However, a 36-fold increase in hand-tractor production in the past 10 years--a growth rate greater than that for any other agricultural machine--is an obvious indicator of the recent high priority given hand-tractor development.

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<sup>14/</sup> Calculations suggest that a claimed 1974 heavy tractor production increase over 1965 was in error and should have referred to total tractor production. If this were not so then either hand-tractor or heavy tractor production was less than zero in 1965 or total tractor production in 1974 was outrageously large figure when compared to other figures available for recent years. Therefore, there is insufficient information about heavy tractors from which to calculate proportions. Although this seems to be the most likely explanation, the reverse could also be true--that is, it is possible that some past estimates of total tractor production were actually only meant to apply to heavy tractors.



## Types of Equipment and Development Priorities

Based on claimed production increases over the past 10 years, hand-tractors, irrigation and drainage equipment, and engines have received the greatest emphasis in PRC mechanization development (table 1). These items have been followed in importance by tractors and combine/harvesters, respectively. Also emphasized have been pumps, processing machinery, and plant protection equipment, in that order. In the last year, emphasis on production of sowers, tractor and engine parts, rice transplanters, plows, and rural vehicles, respectively, has increased significantly. Over the longer period mention has also been made of production increases for wheelbarrow-tired carts and threshers. Production of these items corresponds with the needs that would be expected in transforming brigades, communes, and counties into the Tachai-type model.

Development priorities are suggested by percentage increases for the different types of machinery. For example, it was claimed that in the first three quarters of 1975, production of diesel engines and tractors increased more than 40 percent over 1974, but lower growth rates were mentioned for the increased production of plowing machines, processing machinery, plant protection equipment, and vehicles for rural use. Similarly, for the fourth 5-year plan (1971-75), production of internal combustion engines was expected to achieve more than a 300-percent increase, but no specific claims were made for lower priority machinery. As far back as 1965, the same priorities for production of irrigation and drainage equipment and internal combustion engines are clear. Compared with 1965, production of these items increased elevenfold and twelvefold, respectively in 1974. In contrast, output of threshers, processing machines, and combine/harvesters achieved much smaller growth rates.

Compilation of local 1975 reports suggests that primary demand existed for irrigation and drainage equipment (such as electrical pumps, dredgers, and ditchers), followed very closely by tractors of all sizes, attachments for these tractors, and diesel engines or other motors to run the machinery. The next most commonly demanded types of equipment apparently were processing machinery (such as fodder crushers, flour mills, sugar-refining equipment, and oil presses), threshers and winnowers, and rice transplanters or planting and sowing equipment for crops other than rice.

The emphasis on irrigation and drainage equipment is of course due to the campaign to push Tachai-type agricultural development across the nation. Priority production of diesel and other engines is also in large part due to the water control campaign, since water pumps are also run with these motors.

Production of hand-tractors is probably receiving priority because of the simpler design and easier manufacture of these items. However, it is also a reflection of the relatively small field size, the relatively greater cost of producing larger tractors, and the suitability of hand-tractors to the primarily multiple-cropped rice farming conditions in the PRC.



Table 1--People's Republic of China: Indices of claimed production increases for various types of agricultural machinery, 1974-75, 1970-75, and 1965-74

Agricultural machine	1974-75 <u>1/</u>	1970-75	1965-74
	(1974 = 100)	(1970 = 100)	(1965 = 100)
Hand tractors .....	130-160	700	3,700
Irrigation and drainage equipment	NA	430	1,200
Internal combustion engines .....	140	400	1,300
Total tractors .....	140	900	600 or <u>2/</u> 640
Combine/harvesters .....	140	Large	280
Pumps .....	Large	NA	750
Processing machinery .....	Large	Large	Several-fold
Plant protection equipment .....	Large	Large	NA
Sowers .....	200	NA	NA
Tractor and engine parts .....	140	NA	NA
Rice transplanters .....	130-160	NA	NA
Plows .....	Large	NA	NA
Rural vehicles .....	Large	NA	NA
Wheelbarrow-tire carts .....	NA	NA	500
Threshers .....	NA	NA	Several-fold

NA = Not available.

1/ Three-quarters data only.

2/ 1974 over 1964; 1964 = 100.

More than 30 types of implements which can be attached to hand-tractors and which can be produced by small local factories are now being popularized. These accessories reportedly enable the hand-tractor to perform multipurpose operations, including plowing, harrowing, seeding, harvesting, delivering goods, leveling land, plowing roots under the soil surface, building ridges, spraying insecticides, pumping water, and generating electricity. In addition, these attachments themselves have multiple uses. For example, one rice harvesting attachment for a hand-tractor used in Kwangtung was reportedly able to reap and thresh simultaneously, to work in both tall-and short-stem rice, and to work on dry, wet, or soft land surfaces. Successful development and popularization of such relatively simple, multipurpose accessories could make the largest contribution, primarily by locally self-reliant efforts, to achieving the goal of basic mechanization by 1980.

The success of the PRC's mechanization efforts will also depend on producing adequate supplies of oil, coal, and electricity to run the machines and on growth of the capacity to produce other inputs such as iron and steel, from which the machinery will be manufactured. The 1975 reports indicate that the PRC realized both of these needs. In most of the Province-level units which seem to be active in the present phase of basic national mechanization, there seems to be an awareness of the need and a campaign to promote an increase in the production of coal, steel, and other inputs, in order to keep pace with increasing demand.

### Regional Priorities

In early 1975, farm machinery was reported to have been delivered in amounts 10 percent greater than during the same period of 1974 to the provincial-level units of Peking, Shanghai, Hopeh, Hupeh, Liaoning, Kweichow, Kansu, Sinkiang, Ningsia, and five other Provinces. The available provincial reports for 1975 seem to indicate that most of the general farm mechanization activity took place in the large southeastern rice areas of Kwangtung and Kwangsi and in the suburban areas of Peking and Shanghai, and will be followed by mechanization in the northeastern and northwestern regions. Apparently, national emphasis has then been on mechanization in suburban and some major grain producing areas, and secondarily on pastoral areas. Development of machines for pastoral areas may be a necessity, rather than an important national development priority per se, because of the greater amounts of land to be cultivated relative to the sparse population in these areas.

After irrigation and drainage equipment, hand-tractors, and diesel engines, secondary demand in the tropical southern and eastern areas of the nation seems to have been in plant protection and spraying equipment. In contrast, the north and northeast regions attached secondary importance to transportation vehicles--such as trucks, lorries, or trailer attachments for tractors. These machines were followed in importance by large combine/harvesters or other harvesting or reaping attachments. In the east, central, and southeastern regions, the newly developed rice cultivation boats also seemed to be of some interest. Finally, field management equipment for such operations as tilling, weeding, seedling digging, mowing, and fertilizer spreading were in minor demand in selected areas.

Although these past priorities do not positively identify the course of mechanization that can be expected in the PRC, they provide a rough idea of which items will be of most widespread importance immediately. In general, the priority agricultural machinery is characterized by multipurpose use, relatively simple design and operation, local suitability, low-cost production and operation, and being labor saving in the more labor-intensive operations. Other machinery having these or similar characteristics can be expected to be given the quickest and most extensive use in the future.~

### Effects of Mechanization

The PRC claims that mechanization is being carried out to conserve labor in peak seasons when it is in short supply. Increased rural unemployment should not be a problem, therefore, since at this stage of mechanization, machines will not replace labor, but will free labor to do other necessary tasks more expeditiously. 15/

With mechanized processing, labor could be freed from threshing floor operations to complete hand-harvesting of one crop and hand-planting of another crop more quickly, thereby permitting an increase in multiple-cropping from one to two or from two to three crops per year. In local cases where the length of crop-growing cycles requires that two crops be interplanted for a short period, an increase in the rate at which the harvesting and planting can be accomplished might save enough time so that the two crops no longer always need be interplanted. In addition, some of the farm machines designed by the PRC have taken into account the practice of planting rows of seedlings between rows of mature crops, and therefore have been designed with narrower widths so as to avoid ruining one crop while tending or harvesting the other. Therefore, the interplanted crop area probably will not be adversely affected by increased mechanization, and the multiple-cropped area probably will be increased by mechanization. The net result should be increased output, especially when increased mechanization is combined with other input improvements. Thus, the area that is power irrigated and the area that is machine cultivated are definitely expected to increase. 16/

There is little likelihood that the mechanization campaign will increase PRC imports of agricultural machinery. The only exception to this--under present policies--might be imports of an unusually successful technology which, if copied, could be introduced more quickly than if designed and produced domestically and which would result in significant output or yield increases immediately. It is, however, possible that increased mechanization in the PRC might cause the available oil exports to decline if mechanization

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15/ One report suggested that a small tractor with a harvester attached can save the work of 30 persons in a rice harvest season, while another report stated that because of mechanization, a single county saved more than 500,000 workdays in processing in one year.

16/ In one prefecture in 6 years, the area power irrigated increased 183 percent and the area machine cultivated increased 313 percent after agricultural development and mechanization.



should grow at a faster rate than domestic oil production. In addition, it is possible that increased PRC import demand for steel or other presently imported components of agricultural machinery might occur. A small amount of the PRC's mechanization equipment and technological expertise will continue to be exported, principally to developing countries. Among the items now exported are 3- to 250-horsepower tractors, rice hullers, 9- to 40-horsepower irrigation pumps, threshers, and flour mills. The amounts of these exports, however, will depend upon the requirements of the aid/trade programs to developing countries and the rate of growth of the PRC's production capacity. (Carolyn L. Whitton)

### Land Improvement and Water Control

Based on the Tachai model, the general national pattern of land improvement and water construction in 1974/75 moved from completion of the first 10 years of activity on the Hai River in the North China Plain to activity along the upper Yellow River Basin in the northwestern Provinces of Shensi, Kansu, Ningsia, and eastern Tsinghai. <sup>17/</sup> Of course, general land and water improvement activity still continued in every area of the nation on a local level.

In general, the scope of land and water improvement policies has followed the Eight-Point Charter and other national agricultural development policies. Land improvements such as leveling, embanking, and terracing are usually followed by soil improvements, including deep plowing, afforestation, and fertilization, so that the topsoil better conserves water and prevents erosion. These efforts involve a large amount of labor and earth work or masonry. Shortly after this initial land improvement effort gets underway, a water control effort is begun. Water control includes river dredging, dike reinforcing, ditch digging, and reservoir and well building for the purpose of adequately irrigating and draining fields. These efforts to control the water and to use it adequately also involve sizable investments of manpower and stone or earthwork. In addition, sideline activities, such as production of cement, steel, coal, and electricity; training of hydrology and machinery technicians; and extensive use of pumping machinery are often begun at this stage. As a result of these land and water improvements, there is a steady increase in the area that is drought-resistant and free of waterlogging, and gradual transformation of low-yield land into area meeting a set of irrigated land standards. Ultimately, after further specific leveling, terracing, and fertilization efforts, a category of fields is developed that has higher and stabler yields, are large enough to be mechanically cultivated, that will yield optimal responses to other inputs such as improved seeds, and that can be interplanted or multiple-cropped.

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<sup>17/</sup> Land and water improvements are reported on a quarterly basis beginning on October 1 and ending September 30 of the following year; however, the actual beginning and ending dates of these activities can vary with locality, and in general, they run from the fall harvest of one year to the fall harvest of the next.

In 1974/75, total PRC cultivated area was reportedly 100 million hectares, or slightly more than 10 percent of total land area. Total cultivated area has gradually declined over time, but the number of high- and stable-yield fields has risen significantly, reaching 34 million hectares in 1975. Also, the amount of cultivated area claimed to be irrigated has continued to climb from the 40 percent reported a few years ago. <sup>18/</sup> By the end of 1974, tractor-plowed area had also doubled over that existing prior to the Cultural Revolution. In 1974, the afforested area was reportedly double that of 1949. Although this is claimed to represent a growth rate that is 75 times greater than that achieved during Nationalist rule, it is a much slower rate of progress than that in other land development projects.

### Land Improvement

Land improvement efforts in 1974/75 were generally described as comparable to those of previous years. Leveling was accomplished on 5.3 million hectares, 1.13 million hectares were terraced, and .4 million hectares of new land were reclaimed. Also, more than two-thirds (or close to 17 million hectares by the end of 1974) of the 23.3 million hectares of low-lying land susceptible to drought and waterlogging were reported to be protected by adequate drainage systems crisscrossing the fields. A subsequent report added that 2 million hectares were freed from the threat of drought and waterlogging in 1975. <sup>19/</sup> Finally, 4.52 million hectares of low-yield land was transformed in 1974/75.

### Water Control

The total land and water construction effort in 1974/75 involved building 1.5 million water and land projects. This required a labor investment of over 100 million people in 11 billion cubic meters of earth and stone work. In each of the previous 4 years, a similar amount of labor constructed fewer projects involving only an average of 5.5 billion cubic meters of earth and stone work. Still, the scale of farmland and water improvement projects in the last 5 years has been claimed to be bigger than in previous periods.

At the end of 1975, it was reported that 26 years of water construction efforts had produced a total of 40 million horsepower for irrigation and drainage systems--an increase of 10 million horsepower over 1973 (table2). A total of 60,000 small power stations and 300 large and medium power stations

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<sup>18/</sup> For several years, total irrigated area has reportedly exceeded 40 percent of total cultivated area. In 1974, a U.S. water resources delegation was told by PRC officials that total irrigated area at the end of 1973 was 43.3 million hectares, 40.8 percent of a cultivated area of 106 million hectares. They were told that standards for defining irrigated area had risen since 1966. In December 1975, a Yugoslav newsman was told that the plan for 1980 was 50 million hectares irrigated, an amount 25 percent greater than the present irrigated area and equal to about half of the arable land. Thus, total irrigated area at present must still be about 40 to 45 million hectares.

<sup>19/</sup> Two-thirds of 23.3 million hectares is only 15.5 million hectares; PRC reporting on this is either inconsistent or leaves unclear whether the 2 million hectares are included in the 17-million-hectare total or in addition to it.



have been built since the first 5-year plan (1953-57). 20/ Also, there are now more than 2,000 large and medium sized reservoirs (280 large and 1,800 medium in 1973), with a total water storage capacity of 280 billion cubic meters and more than 100 times as many small reservoirs as in 1949. 21/ "Pump wells," located mostly in the northern plain, now number 1.7 million, with a million added since 1971. These wells, which are usually tube wells, run from 30 to 200 or more meters deep. Dikes, another important water improvement, continued to be reported as 130,000 kilometers in total length in 1975--the same as first reported at the end of the 1972/73 land and water improvement year. Although land and water improvement efforts of the past 5 years are claimed to have been the most substantial, very few specific achievements were claimed in 1974/75--only 100 large channels were reported to have been added or improved. 22/

Table 2--People's Republic of China: Totals of various water equipment, 1949, 1965, and selected years, 1970-75

Type of equipment	: : 1949	: : 1965	: : 1970	: : 1973	: : 1974	: : 1975
Irrigation and drainage (million horsepower) . . . . .	: : .88-.97	: : 7.5-10	: : NA	: : 30	: : 30	: : 40
Large- and medium-sized reser- voirs (number) . . . . .	: : 10-20	: : 1,400	: : NA	: : 2,000	: : 2,000	: : 2,000
Pump wells (millions). . . . .	: : NA	: : .1	: : .7	: : 1.2	: : 1.3	: : 1.7

### Irrigated Area Increases

One result of the 1974/75 land and water improvement activities was addition or improvement of 4 million hectares of irrigated land. 23/ During.

20/ A small power station is generally less than 500 kilowatt capacity, although some at the county level may go up to several thousand kilowatts. The term power stations refers to both thermal and hydroelectric stations.

21/ A large reservoir has a water storage capacity of more than 100 million cubic meters; a medium sized reservoir has 10 to 100 million cubic meters; and a small reservoir stores 100,000 to 10 million cubic meters of water.

22/ A large channel has a discharge of several hundred or more cubic meters per second.

23/ Improved irrigated area is assumed to be area previously counted in total irrigated area, but on which water delivery facilities have been upgraded--e.g., by replacing mechanical pumps with an electrical pump. Irrigated area added and improved is usually reported on a partial-year or quarterly basis. Reports for 1974/75 indicated that 1.46 million hectares had been added or improved by the end of 1974, 2 million by the end of January 1975, 2.7 million during March 1975, 3.3 million by the end of spring 1975, and 4 million by the end of June.

No reports were issued in the last quarter through September, when most farming activity would have been concentrated on crop tending rather than inputs.



1971-75, an average of 1.3 million hectares of irrigated acreage reportedly was added each year--which is lower than the annual average reported for 1971-74. Since 1975 was reported to have been the best year ever for land and water improvement activity, it is assumed that most of the 4 million hectares added or improved in 1974/75 must have been improved. Based on the calculated increase of 10 million horsepower for irrigation and drainage, improved pumping equipment apparently was installed on a large number of already irrigated fields.

Totaling the irrigated acreage indicated in provincial reports (table 3) gives an estimated maximum of 45.3 million hectares of total irrigated area in recent years. The PRC reported that in 1975, the most important agricultural Provinces, particularly those in the south, had irrigated half or more of their cultivated land. However, Szechwan--one of the largest southern rice producing Provinces--has not reported any irrigated acreage figures in recent years, creating a possible exception to the PRC claim.

In 1949, the northern region alone had only 11 percent of the total irrigated area (an additional 1 percent was in the northeast), while the central, southeast, southwest, and eastern regions together had 75 percent of the total. Although the northern region's share of total irrigated area has increased steadily over the past 26 years, the northeastern region has had the most rapid growth especially in recent years.

Although the proportion of total irrigated area located in the eastern and central regions has declined over the past 26 years, the total irrigated area in these regions has remained approximately stable, showing only the slightest increases. Irrigated area in the two southern regions started from a base lower than that of the eastern and central regions, so they made more significant increases during the first 5-year plan period before leveling off to only slight increases recently. During that period, a large-scale national water control effort was undertaken, mainly along major rivers in the north, northeast, southeast, and southwest. The early effort was followed by a combination of smaller local efforts and state programs on major rivers, mainly in the north and more recently in the northeast.

#### Effects of Water and Land Improvement in 1975

In the hilly southern areas, water construction efforts in 1974/75 were concentrated on ponds, reservoirs, and water-hoisting systems. In the north, the focus was on wells complete with auxiliary equipment. In the central and eastern regions, it was on completion of major river control systems, down to the local irrigation and drainage channels.

Some mention was also made of local efforts to separate irrigation and drainage systems, which could help alleviate waterlogging. In addition, production of submergable, electrical pumps suitable for use in deeper wells seems to be receiving greater attention.

In the northern region, both the state and local portions of the first 10-year plan (1965-74) for improvement of the Hai River system were completed.

Table 3--People's Republic of China: Total area irrigated 1973/75

Administrative unit	1975	1974	1973	Regional totals 1/	Regional percent of total
		<u>Million hectares</u>			<u>Percent</u>
PRC total .....				<u>2/45.3</u>	
Heilungkiang .....	1.13-1.53	.93	.83		
Kirin .....	.68-.714	.60	NA		
Liaoning .....	NA	1.30	NA		
Total Northeastern .....				3.11-3.544	8
Honan .....	3.3-3.6	3.20	NA		
Hopei .....	3.3-3.6	3.30	NA		
Peking .....	.3375	.3	.2574		
Shansi .....	NA	.931	.688		
Shantung .....	2.6-3.3	<u>3/3.2-3.5</u>	NA		
Tientsin .....	.0639	NA	.0353		
Total Northern .....				10.53-11.92	30
Anhui .....	NA	<u>4/.53</u>	<u>5/3.0</u>		
Chekiang .....	<u>3/1.35</u>	1.06	<u>6/1.44</u>		
Kiangsu .....	<u>3/2.64</u>	<u>6/3.3</u>	NA		
Shanghai .....	<u>3/.35</u>	<u>3/.35</u>	<u>3/.35</u>		
Total Eastern .....				4.58	11.5
Hunan .....	1.26	.824	<u>3/7/2.3</u>		
Hupei .....	NA	NA	<u>6/2.4</u>		
Kiangsi .....	NA	NA	<u>7/1.46</u>		
Total Central .....				5.12	13
Fukien .....	<u>3/0.975-1.125</u>	NA	<u>7/1.08</u>		
Kwangsi .....	1.13	NA	<u>6/1.3</u>		
Kwangtung .....	NA	2.53	<u>5/2.9</u>		
Total Southeastern .....				4.635-4.785	12
Kweichow .....	NA	NA	<u>8/.8</u>		
Szechwan .....	NA	NA	<u>7/3.6</u>		
Tibet .....	<u>3/8/.167-.178</u>	<u>3/8/.161-.172</u>	NA		
Yunnan .....	NA	NA	<u>7/.86</u>		
Total Southwestern .....				<u>8/5.04</u>	<u>8/12.5</u>
IMAR .....	<u>8/.283</u>	<u>8/.1907</u>	<u>8/.1507</u>		
Kansu .....	NA	NA	<u>7/.4</u>		
Ningsia .....	<u>4/.06</u>	<u>4/.06</u>	<u>6/.23</u>		
Shensi .....	1.13	1.096	<u>6/1.3</u>		
Sinkiang .....	<u>6/2.4</u>	<u>8/.666</u>	NA		
Tsinghai .....	.160	.147	<u>6/.166</u>		
Total Northwestern .....				<u>8/2.86</u>	<u>8/7</u>

NA = Not available. All data from PRC sources unless otherwise specified.

1/ 1975 or year for which most recent data are available.

2/ Maximum total derived from highest data listed in any of years given.

3/ Derived from percentages of estimated cultivated areas.

4/ Partial.

5/ Wiens, Thomas B. Agricultural Statistics in the PRC, Mathematica Inc., Joint Cmte. on Contemporary China, 17-18 Jan-75, p. 141-42.

6/ Estimates for year listed from unpublished research of J. Nickum at U. C. Berkley.

7/ Estimates provided by J. Nickum for years prior to 1973.

8/ Excluding grassland irrigated.

This effort included construction of 31 trunk canals of 2,800 kilometers length, 2,700 kilometers of flood control dikes, 500,000 pump wells, and innumerable bridges and culverts. As a result, about 1 million hectares of saline and alkaline farmland have been transformed, a decrease of 58 percent from the original amount. In addition, half of the farmland in the basin is reported to have been irrigated, accounting for a large portion of the increase in total irrigated area in the north.

Following completion of the first 10 years of Hai River control, more attention was placed on controlling the Yellow River. In the northwest, along the upper reaches of the Yellow River, a number of large-scale, multipurpose, state hydroelectric projects began operating in 1974/75. Included are the 5-unit, 1,225-megawatt Liuchiahsia project and the 3-unit 108-megawatt Papanhsia project in Kansu; the 6-unit Chingtunghsia project in Ningsia; the 135-megawatt Shihchien project and the Paochihsia project in Shensi; the Tengkou irrigation project in Inner Mongolia; and the 14-million cubic meter water capacity Hutoushan Reservoir in Sinkiang. To control silt at its source, heavy afforestation work has also taken place in this area. Shensi, Kansu, and Ningsia alone have afforested 533,000 hectares along the upper Yellow River. Completion of these hydroelectric projects and afforestation along the upper Yellow River can be expected to increase both the total amount and the portion of national irrigated land located in the northwest.

The only other project of major significance completed in 1974/75 was in the eastern region, where the Huai River was diverted. Some of its discharge will now flow northeast through the manmade New Pien River and into the I and Shu Rivers' outlets to the sea, rather than southeast to the sea through the already overburdened Yangtze. In addition, the waters of the Huai will now enable the I and Shu Rivers to be used for irrigating the formerly dry northern Kiangsu area. In conjunction with this system, several new, large-scale, multipurpose projects became operative in this region this year.

Overall, the emphasis on steadily increasing the irrigated area will help to improve the stability of crop output. The stability of the output of wheat and some miscellaneous grains should be especially enhanced by the increasing portion of the irrigated area located in northern wheat growing areas. Recent increases in soybeans can also be partially explained by the rapid growth of irrigated area in the northeast. In addition, in conjunction with other inputs such as fertilizer and improved seeds, the fluctuation in all crop yields ought to be reduced. In fact, without irrigation, the effect of these other inputs would be greatly reduced. The usefulness of farm machinery would also be decreased without land improvement efforts, thereby eradicating mechanization's savings in labor and the potential growth of agricultural development from application of that labor to other sectors in the longrun. Finally, the number of Provinces self-sufficient in food production will certainly increase as the ability to control water and to use it effectively moves north and west. (Carolyn L. Whitton)



Increased use of chemical fertilizer has made a major contribution to recent progress in Chinese agriculture. During 1964-74, fertilizer production rose at an average annual rate of almost 16 percent. Official statements on 1975 fertilizer production are incomplete and conflicting, but production is estimated to have reached about 6.1 million tons (nutrient weight 25/), roughly 20 percent above the 1974 level. Since problems with coal production and cutbacks in phosphate rock imports held total 1974 production at approximately the 1973 level, production for the past 2 years has increased at an average annual rate of about 10 percent, somewhat below the growth rate of the past decade.

Based on a production of 6.1 million tons, 1975 chemical fertilizer consumption (production plus imports) rose to 7.3 million tons, 18 percent above the 1974 level but only 12 percent over 1973 because of a decline in consumption in 1974. Assuming that potassium fertilizer production continued its trend increase of recent years and that there was no significant change from 1974 in the proportion of nitrogenous and phosphate fertilizers, total 1975 consumption in nutrient terms can be broken down into approximately 5 million tons of nitrogen (N), 2 million tons of phosphorous ( $P_2O_5$ ), and 300,000 tons of potassium ( $K_2O$ ). This places the nutrient ratio in 1975 consumption at 2.5:1:0.15 (N: $P_2O_5$ : $K_2O$ ).

Total fertilizer imports rose slightly in 1975 but remained almost 20 percent below 1973 levels. Imports supplied about 1.1 million tons of nitrogen, slightly more than 20 percent of total nitrogen consumption during the year. China remained the world's largest importer of nitrogen fertilizers, importing about 590,000 tons of nitrogen from Japan and most of the remainder from Nitrex, the Western European consortium, and from Eastern Europe. Very little manufactured phosphate fertilizer was imported during the year, but imports provided about one-third of estimated consumption of potassium fertilizers, with the majority of this coming from Canada. Phosphate rock imports in 1975 were probably close to the 1974 level of about 300,000 tons (excluding rock imports from other Communist countries) but were sharply below 1973 imports of over 1 million tons. This drop resulted from the sharp increases in world phosphate rock prices in 1974. 26/ Efforts to increase domestic phosphate rock production to compensate for reduced imports have been successful to the extent that 1975 production of phosphate fertilizer recovered to about the 1973 level after a drop in 1974.

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24/ Fertilizer production and consumption estimates for 1974 and earlier years are taken from Central Intelligence Agency, People's Republic of China: Chemical Fertilizer Supplies, 1949-1974. Aug. 1975.

25/ With the exception of phosphate rock, which is reported in gross product weight, all weights are given in tons of nutrient: N for nitrogenous fertilizer,  $P_2O_5$  for phosphate fertilizer, and  $K_2O$  for potassium fertilizer.

26/ For an analysis of world production and price developments, see Richard B. Reidinger, World Fertilizer Review and Prospects to 1980/81. Econ. Res. Ser. U.S. Dept. of Agr., Foreign Agr. Econ. Rpt. No. 115, Feb. 1976.

Growth of the fertilizer industry in recent years has been based on the simultaneous development of large- and medium-scale plants run by the state and small-scale locally run plants in rural areas. The small-scale plants have been important sources of growth for both nitrogen and phosphate fertilizer, accounting for 60 percent of the increase in nitrogen fertilizer production and more than 80 percent of the increase in phosphate fertilizer production during 1964-74. Stressing the use of locally available raw materials and supplying their output to the counties in which they are located, these small plants have been an important part of rural industrial development efforts and have helped to reduce demands on the heavily pressed national transportation system. There are currently in excess of 2,000 small plants. In 1975, they accounted for 60 percent of total nitrogen production and two-thirds of phosphate production. This share of phosphate fertilizer production is below the 75-percent share claimed for 1973, suggesting that the reduction in phosphate rock imports was met by temporarily diverting supplies of ore from small plants to large ones. <sup>27/</sup> This decline in the small plant share is expected to be only temporary, as the expansion of domestic rock production is being pushed.

The nitrogen fertilizer industry will change dramatically in the next few years. In 1973, faced with limits on the expansion of small-scale production, China purchased 13 of the world's largest synthetic ammonia-urea complexes from the United States, Europe, and Japan. Each of these plants has a daily capacity of 1,600 tons of urea or more (product weight). Several of these are expected to be in production by the end of 1976. When all 13 plants are in production in 1978, they will produce almost 3 million tons of nitrogen per year, an amount about equal to total 1973 nitrogen production. Although some new small-scale plants will be added, the growth of small plant production will slow and their share of production will drop. However, they will continue to be an important source of nitrogen. The jump in nitrogen production resulting from the new plants is expected to lead to sharp cuts in nitrogen fertilizer imports in coming years. But imports of phosphate and potassium fertilizers may be stepped up in order to maintain a nutrient balance in consumption.

The slowdown in the growth of chemical fertilizer consumption over the past 2 years and shortages in some areas in part explain the recent emphasis on the use of organic and indigenous fertilizers. During the past year, greater efforts have been made to collect, process, and apply organic fertilizers, and large increases in application have been claimed in some areas. This has been accompanied by efforts to increase the use of green manure crops, particularly in South China, where the expanded use of azolla, a nitrogen-fixing water fern which can be grown in paddy fields, is being stressed. Azolla does not compete with other crops for land and hence is compatible with efforts to extend multiple-cropping. Such competition is a factor limiting expansion of other green manure crops.

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<sup>27/</sup> Some of the small plants must rely on large state-run mines for rock supplies since only 50 percent of phosphate rock is reported to be produced by small, locally run mines.



An additional element being stressed as a source of organic fertilizer is hog production. The current campaign to increase hog numbers claims increased manure and the resulting increase in grain production as a major benefit.

Finally, the production of indigenous fertilizer, particularly humic acid, is being emphasized. Humic acid fertilizer is a low-grade fertilizer made by combining low-grade coal, lignite or peat with organic wastes and in some cases small amounts of chemical fertilizer or industrial wastes containing plant nutrients. Production of 7.5 million tons in the first 5 months of 1975 was reported, and efforts are being made to popularize and extend its use.

Recent policy statements have emphasized the importance of organic fertilizers in Chinese agriculture and stated that even over the longrun, organic fertilizers will be a major source of plant nutrients. However, it is not likely that sufficient net increases in plant nutrients can be achieved over an extended period by these means. Increasing chemical fertilizer supplies remains an essential part of the program to increase yields and agricultural production. (Frederic M. Surls)

### Seed Technology 28/

The development and use of high-yielding, rapid-maturing, and disease-resistant seed strains is essential to obtaining maximum benefits from increased fertilizer supplies and irrigation, and also to making possible a rapid expansion of multiple-cropping and inter-cropping. Improved strains have been widely introduced in the PRC in recent years. Official statements are vague and contain limited information, but they report three major seed replacements for rice, wheat, corn, and cotton since 1949. Eighty percent of the rice, wheat and cotton acreage is reported to be planted with improved varieties. High-yielding dwarf varieties of rice were widely introduced in the early 1960's, and there has been a subsequent introduction of improved dwarf varieties.

The precise role played by Mexican high-yielding wheat strains and rice strains developed at the International Rice Research Institute (IRRI) is not known. But China has had Mexican dwarf wheat varieties since the early 1960's, and has recently imported Mexican seed wheat. These varieties are now in use in a number of areas and presumably are being used in domestic seed-breeding efforts. IRRI rice varieties have been tested and are reported to have a growth duration which is too long for direct use in China. However, they are being used for crossing with domestic varieties in Chinese breeding programs.

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28/ The most comprehensive account of PRC seed development and research is given in Plant Studies in the People's Republic of China: A Trip Report of the American Plant Studies Delegation. National Academy of Science, 1975. Most of the conclusions on the PRC research program presented here are drawn from that report.



Efforts to introduce new varieties have been supported by an extensive research and extension network, which included national and provincial level agricultural institutes and experimental and demonstration centers extending down to selected production brigades throughout the country. This network has been supplemented recently with an expanded local scientific network centered on the county with units down to the production team level. The emphasis in this "four-level network" is on mass participation in seed research and selection.

The American Plant Studies Delegation and other observers have found the research and extension system to be a largely decentralized one that places heavy emphasis on production applications of known technology at the local level. This emphasis on local work and local initiative has been beneficial to the selection and development of seed strains well-adapted to the diversity of local conditions found in China. But it has also been accompanied in some cases by a lack of communication between research workers in different areas of China.

Despite the progress achieved to date, a longrun continuation of seed development momentum will require more attention to basic research, greater efforts to preserve native genetic materials, improved communication between research programs in different areas, and increased efforts to participate in and draw on research underway in other parts of the world. Without these efforts, the effectiveness of increases in other inputs will be greatly diminished. (Frederic M. Surls)

## FOREIGN TRADE

### Total Trade

According to preliminary U.S. Government estimates, total trade turnover of the PRC in 1975 was \$14.0 billion, unchanged from 1974 levels (table 4). However, exports rose by 5 percent to \$6.8 billion, while imports declined 4 percent to \$7.2 billion. The 1975 trade deficit was \$400 million, a considerable improvement from the 1974 deficit of nearly \$1 billion. The world recession was the main factor slowing the growth of exports, and most of the gain resulted from the approximate doubling of oil exports over 1974 levels.

The decline in the value of imports during 1975 reflects a strenuous effort to reduce the size of the trade deficit. Foreign exchange pressures were severe following the record 1974 deficit, and trimming of imports in 1975 was evident for industrial goods and particularly for agricultural products.

Foreign trade of the PRC is quantitatively small but nonetheless highly significant. China's exports are less than 1 percent of total world exports and about equal to the exports of Norway. Exports amount to only about 3 percent of the PRC gross national product and the import share is only slightly higher--a very low figure by comparison with most other countries. However, trade has been an extremely important vehicle for the

Table 4--People's Republic of China: Selected trade data, calendar years 1972-75, fiscal years 1973-76 1/

Item	1972	1973	1974	1975	1972/73	1973/74	1974/75	1975/76 2/
Million U.S. dollars								
PRC:								
Total exports 3/	3,085	4,960	6,515	6,800				
Total imports 3/	2,835	5,130	7,490	7,200				
Trade balance	250	-170	-975	-400				
U.S. exports to PRC 4/								
Agricultural 4/	63.5	739.7	818.7	303.6	218.3	1,094.9	455.4	
	61.3	625.6	664.3	79.7	204.6	889.1	334.6	
U.S. imports from PRC								
Agricultural	32.4	64.0	88.2	158.3	47.5	81.2	129.1	
	16.4	21.6	26.4	28.2	19.6	23.6	25.0	
PRC grain imports								
From:	4.6	7.8	6.9	3.4	6.4	7.8	6.2	2.1
Argentina	--	0.1	0.7	0.2	0.1	0.3	0.7	--
Australia	--	0.8	1.3	1.3	0.3	1.2	1.4	0.8
Canada	3.7	2.5	1.9	1.9	4.4	1.4	2.3	1.3
United States 4/	0.9	4.3	2.8	--	1.5	5.0	1.5	--
Other	--	--	0.2	--	--	--	0.2	--
PRC wheat imports								
From:	4.3	6.1	5.5	3.3	5.4	5.7	5.7	2.1
Argentina	--	--	0.1	0.1	--	--	0.3	--
Australia	--	0.8	1.3	1.3	0.3	1.2	1.4	0.8
Canada	3.7	2.5	1.9	1.9	4.4	1.4	2.3	1.3
United States 4/	0.6	2.8	1.9	--	0.6	3.2	1.5	--
France	--	--	0.2	--	--	--	0.2	--
PRC corn imports								
From:	0.4	1.6	1.4	0.1	1.0	2.1	0.4	--
United States 4/	0.4	1.5	0.9	--	0.9	1.8	--	--
Argentina	--	0.1	0.6	0.1	0.1	0.3	0.4	--

Note: -- means none or negligible.

1/ Details may not add to totals because of rounding.

2/ Projected.

3/ Exports, f.o.b.; imports, c.i.f. Derived from partner-country trade data and estimates. Data for 1972-74 are from Central Intelligence Agency, People's Republic of China: International Trade Handbook, October 1975. 1975: Preliminary U.S. Government estimates.

4/ Includes transshipments through Canada. See tables 6 and 7.

introduction of modern technology and needed supplies of raw materials and agricultural products. Consequently, it has been a key factor determining the effective rate of capital formation and of economic growth in China.

Much of China's imports have been directed to economic development efforts. Three items--iron and steel, nonferrous metals, and machinery and equipment--accounted for 43 percent of total 1974 imports. <sup>29/</sup> Agricultural imports have also been important. Available data are incomplete, but agricultural imports in 1974 amounted to about 35 percent of total imports. Leading agricultural import items were grains (21 percent of the total value of imports), textile fibers (mainly cotton), sugar, rubber, and oilseeds. With the exception of oilseeds, these items have consistently ranked high in China's import bill.

Manufactured products, in particular textile yarn, fabric, and clothing, have been an important part of PRC exports in recent years, but the largest single category has been primary products, which accounted for 53 percent of 1974 exports. The largest part of this category is agricultural products, accounting for about 40 percent of total 1974 exports. Foodstuffs (excluding fish and fish products) were about 30 percent of exports, with the largest items in this category being rice, live animals, meat and meat products, and fruits and vegetables. Other leading agricultural exports items have been soybeans, crude animal materials, and textile fibers, especially silk. The largest markets for China's agricultural exports have been Hong Kong, Japan, West Germany, Singapore, and France.

China's foreign trade policy has been broadly characterized by PRC officials as one of independence and self-reliance. The meaning of this is imprecise and has varied over time. But for recent years, the policy can be taken as meaning the use of foreign trade to promote modernization and accelerate economic growth, while at the same time avoiding, where possible, excessive dependence on imports and excessive reliance on any one market or supplier. It also means attempting to balance exports and imports and avoiding international debt. This latter restraint has been relaxed somewhat in recent years as China has been willing to accept deferred payment and short-and medium-term credit arrangements in some purchases. However, the continued importance of this restraint in foreign trade decisionmaking was evident in 1975, when imports were sharply curtailed in order to reduce the balance of trade deficit.

### Agricultural Trade

In the import cuts of 1975, the most dramatic decline was in agricultural imports, particularly grain imports. Total grain imports during the year were cut in half, falling to a level of 3.4 million tons (table 4). These

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<sup>29/</sup> The latest year for which relatively complete data are available is 1974. Trade data used here are taken or derived from estimates in Central Intelligence Agency, People's Republic of China: International Trade Handbook, Oct. 1975.



substantial cutbacks were made possible by the good harvests of the past several years and the apparent rebuilding of stocks drawn down following the poor harvest of 1972. Also important in allowing reduced grain imports has been the rapid growth of wheat production and the resulting easing of difficulties in state procurement of wheat for supply to the northern urban areas. An additional element may be the decline in rice exports during the year and the resulting increase in rice available for domestic consumption.

Virtually all of the 3.4 million tons of grain imported in 1975 was wheat. Of this amount, an estimated 1.5 million tons had originally been purchased for 1974 delivery and then deferred until 1975. The only new purchases during 1975 were 1 million tons of Australian wheat scheduled for delivery between April 1975 and March 1976 and 1.1 million tons purchased from Canada for delivery between May 1975 and March 1976. Contracts for nearly 1 million tons of U.S. wheat were terminated in January and February 1975 (table 5). As a result, U.S. grain exports to the PRC fell to zero from a 1974 level of 2.8 million tons (tables 6 and 7). No new contracts were concluded during the year with Argentina and the last shipments of grain from Argentina to the PRC occurred in February 1975. This seems to suggest that the 3-year agreement with Argentina, providing for the purchase of 3 million tons of grain during the 1974-76 period, has been terminated.

Following corn shipments from Argentina in early 1975, no additional corn was imported during the year. China was actually a small net exporter of corn in 1975, shipping an estimated 150,000 tons, of which 85,000 tons went to Japan. In addition to corn, small amounts of other grains, including sorghum, barley, and buckwheat, were exported during the year, mainly to Japan and Hong Kong.

Rice has been the largest single agricultural export of the PRC in recent years (table 8). China has consistently ranked among the leading rice exporters and was the world's largest rice exporter in 1973 and 1974. Rice exports during 1975 fell by slightly less than 20 percent to an estimated 1.6 million tons (milled weight), second only to U.S. exports of 2.0 million tons. This drop resulted from a record world rice harvest, a consequent fall in import demand in many of China's markets, and increased competition from other exporters.

Significant changes occurred during the year in PRC trade in industrial crops. Despite drops in domestic cotton production in both 1974 and 1975, cotton imports, a leading trade item in 1974, declined sharply (table 9). This was primarily the result of the depressed world market for cotton textiles and the resulting drop in PRC cotton textile exports. Total raw cotton imports for the 1974/75 marketing year were 60 percent below imports in the previous year, falling to an estimated level of 150,000 tons. Because of reduced textile exports and balance-of-payments pressure the PRC temporarily became a cotton exporter in 1975, selling approximately 50,000 tons. Hong Kong took 32,400 tons, making the PRC Hong Kong's second leading supplier of cotton in the year.

Soybeans have traditionally been an important PRC export item, although China temporarily became a net importer in 1974, purchasing 570,000 tons from

Table 5 --People's Republic of China: Major grain contracts and contract terminations, 1973-76 1/

Country	Date	Amount <sup>2/</sup>	Type	For shipment during	Remarks
		1,000			
		metric tons			
Argentina .....	Dec. 1973	3,000	Wheat and corn	Calendar 1974-76	The first long-term agreement since 1966. Called for mainly corn in 1974 and 50 per cent each of wheat and corn in 1975 and 1976.
	Dec 1973	200	Corn	Jan.-Mar. 1974	First contract under long-term agreement.
	May 1974	500	Corn	June-Dec. 1974	No further contracts have been concluded.
		150	Wheat	June-Aug. 1974	
Australia .....	Oct. 1973	Up to 4,710	Wheat	Calendar 1974-76	Called for 1.1 million tons in 1974 and 1.5 to 1.8 million tons in 1974 and 1975. Specific quantities and schedules to be set in separate contracts.
	Oct. 1973	600	Wheat	Jan.-June 1974	First contract under 3-year agreement.
		500	Wheat	July-Dec. 1974	Specifics of July-December portion negotiated in June 1974.3/
	July 1974	500	Wheat	July-Dec. 1974	Supplementary to amounts in long-term agreements.
	Jan. 1975	1,000	Wheat	Apr. 1975-Mar. 1976	Second contract under 3-year agreement.3/
	Jan. 1976	700	Wheat	Dec. 1975-Nov. 1976	Third contract under 3-year agreement. July 1974 supplementary purchase now included under 3-year agreement quantities.
Canada .....	Oct. 1973	4,900-6,100	Wheat	Calendar 1974-76	Agreement provides for quantities and delivery schedules to be set in separate commercial sales contracts.4/
	Oct. 1973	1,016	Wheat	Jan.-June 1974	First contract under agreement.
	June 1974	2,030	Wheat	July-Dec. 1974	Half to be counted as part of 3-year agreement quantities, half supplementary.
	Apr. 1975	1,140	Wheat	May 1975-Mar. 1976	Third contract under agreement.
	Feb. 1976	965	Wheat	Apr.-Dec. 1976	Fourth contract under agreement.
United States <sup>5/</sup> ...	June 1973	2,500	Wheat	June 1973-July 1974	
		1,000	Corn		
	July 1973	500	Wheat	Aug.-Dec. 1973	
	Aug. 1973	300	Wheat	By June 30, 1974	
		300	Corn		
	Oct. 1973	400	Corn	Marketing year 1974-75	
	Nov. 1973	500	Wheat	Marketing year 1974-75	
	May-June 1974	(1,400)	Corn		Termination of contracts. Approximately 1 million tons from 1973-74 marketing year and 0.4 million tons from 1974-75 marketing year.
	July 1974	600	Wheat	Marketing year 1974-75	From July to October about 680,000 tons were shifted to the 1975-76 marketing year.
	January 1975	(600)	Wheat		Termination of contracts. Half of this amount from 1974-75 marketing year and remainder from 1975-76.
	February 1975	(380)	Wheat		Termination of remaining outstanding contracts.

1/ Contrast data for earlier years is given in *The Agricultural Situation in Communist Areas: Review of 1970 and Outlook for 1971*, ERS-Foreign 314, Econ. Res. Serv., U.S. Dept. of Agr., Apr. 1971, pp. 35-36 and *The Agricultural Situation in the People's Republic of China, Review of 1973 and Outlook for 1974*, ERS-Foreign 362, May 1974, pp. 13-14. Contract data for 1973 is taken, with some revision, from ERS-Foreign 362.

2/ Numbers in parentheses indicate contract termination of the amount indicated.

3/ Payment and interest within 12 months of shipment.

4/ Twenty-five percent cash when loaded, balance plus interest within 18 months.

5/ Incomplete and approximate. Derived in part from weekly changes in outstanding sales as reported in weekly issues of *U.S. Export Sales*, U.S. Dept. of Agr.

Table 6--United States: Agricultural exports to the People's Republic of China, by quantity and value, calendar years 1972-75

Item	Direct shipments <u>1/</u>				Transshipments				Total exports <u>2/</u>			
	1972	1973	1974	1975	1972	1973	1974	1975	1972	1973	1974	1975
	<u>1,000 dollars</u>											
Wheat .....	35,293	277,709	234,015	--	--	29,799	--	--	35,293	307,508	234,015	--
Corn .....	23,792	132,384	95,671	--	--	8,791	--	--	23,792	141,175	95,671	--
Tobacco .....	--	1,359	2,718	--	--	--	--	--	--	1,359	2,718	--
Hides and skins .....	--	391	121	--	--	--	--	--	--	391	121	--
Soybeans .....	--	43,365	126,519	9	--	12,031	11,723	--	--	55,396	138,242	9
Cotton .....	--	100,527	185,934	79,658	--	--	--	--	--	100,527	185,934	79,658
Tallow, inedible .....	--	--	1,344	7,539	--	--	--	--	--	1,344	7,539	--
Soybean oil, crude .....	2,200	17,863	--	--	--	--	--	--	2,200	17,863	--	--
Others <u>3/</u> .....	--	43	42	22	--	--	--	--	--	43	42	22
Total agricultural .....	61,284	574,984	652,559	79,689	--	50,621	11,723	--	61,284	625,605	664,282	79,689
Total nonagricultural .....	2,253	114,128	154,377	223,947	--	--	--	--	2,253	114,128	154,377	223,947
Total exports .....	63,537	689,112	806,936	303,636	--	50,621	11,723	--	63,537	739,733	818,659	303,636
	<u>1,000 metric tons</u>											
Wheat .....	565	2,649	1,905	--	--	166	--	--	565	2,815	1,905	--
Corn .....	376	1,393	854	--	--	107	--	--	376	1,500	854	--
Tobacco .....	--	1	1	--	--	--	--	--	--	1	1	--
Hides and skins <u>4/</u> .....	--	35	20	--	--	--	--	--	--	35	20	--
Soybeans .....	--	198	570	--	--	53	49	--	--	251	619	--
Cotton <u>5/</u> .....	--	610	785	265	--	--	--	--	--	610	785	265
Tallow, inedible .....	--	3	18	--	--	--	--	--	--	3	18	--
Soybean oil, crude .....	10	58	--	--	--	--	--	--	10	58	--	--

Note: -- means none or negligible.

1/ As reported by the U.S. Bureau of the Census; excludes transshipments via Canada.2/ Exports plus transshipments.3/ Includes small amounts of baby chickens, peanuts, beans, waxes, and vegetable seeds.4/ Numbers in thousands.5/ Thousand running bales of approximately 500 lbs. each.

Source: U.S. Bureau of the Census, U.S. Agricultural Exports, country by commodity, 12/31/74, 12/31/75.

U.S. Department of Agriculture, Economic Research Service, U.S. Foreign Agricultural Trade Statistical Report, calendar years 1973 and 1974.





Table 8 --People's Republic of China: Rice exports, by destination, 1971-75 1/

[illegible]

Note: -- means none or negligible.

1/ Incomplete. As reported by importing country.

2/ Preliminary.

3/ Estimated--rice imported through Hong Kong believed to be of Chinese origin.

4/ Partly estimated or unofficial.

Source: FAO, "The Rice Situation in the People's Republic of China," CCP: RI 76/C.R.S. 2, March 1976.

Table 9--People's Republic of China: Cotton imports,  
by country of origin, 1970/71-1974/75 1/

	:	:	:	:	:
Country	: 1970/71	: 1971/72	: 1972/73	: 1973/74	: 1974/75
	:	:	:	:	:
	:				
	:				
	:				
	:				
	:				
	:				
Brazil .....	--	--	29.2	7.6	<u>2</u> /--
	:				
East Africa <u>3</u> /	: 13.5	23.3	40.9	49.6	<u>4</u> /3.7
	:				
Egypt .....	: 15.5	17.0	13.9	7.4	<u>5</u> /1.3
	:				
Greece .....	--	--	--	1.1	1.1
	:				
Iran .....	: 2.2	8.1	44.0	2.4	<u>5</u> /2.8
	:				
Pakistan .....	: 11.1	18.1	25.9	2.0	<u>4</u> /18.5
	:				
Sudan .....	: 33.1	37.2	41.8	33.3	<u>6</u> /7.4
	:				
Syria .....	: 15.7	15.0	16.3	28.3	8.1
	:				
Turkey .....	--	14.2	50.9	12.8	--
	:				
United States .....	--	--	127.4	195.5	66.8
	:				
Other <u>7</u> / .....	: 4.1	18.1	34.8	45.7	6.5
	:				
Total .....	: 95.1	150.9	425.2	385.8	<u>8</u> /150
	:				

Note: --means none or negligible.

1/ Marketing years beginning August 1 unless noted otherwise. Data are as reported by exporting country and are converted from 480 lb. bales (1 ton = 4.593 bales).

2/ August-February.

3/ Kenya, Tanzania, and Uganda.

4/ August-April.

5/ August-March.

6/ August-December.

7/ Mostly Afghanistan, Colombia, India, Mexico, and Morocco.

8/ Preliminary estimate.

Source: U.S. Department of Agriculture, Foreign Agricultural Service, Foreign Agriculture Circular FC 1-76, p. 20.



the United States. These purchases, all of which were contracted in 1973, resulted from a poor crop in 1972. Problems with the use of imported beans for human consumption and the substantial increase in soybean production in 1973 and 1974 resulted in a cessation of soybean imports in 1975, except for a small quantity purchased from Brazil. With the ending of imports, China again became a net exporter of soybeans in 1975, exporting an estimated 350,000 tons. Japan was again the largest buyer of PRC soybeans, taking 240,000 tons.

Complete data on live animal, meat, and meat product exports during 1975 are not available. But exports of live animals--mainly hogs--to China's major market, Hong Kong, rose 6 percent to \$208 million. The PRC supplied 90 percent of Hong Kong's total imports of live animals during the year. Exports of meat and meat products to Hong Kong jumped 52 percent to \$79.4 million in 1975.

### Trade with the United States

The rapid growth of U.S. agricultural exports to China which marked the years 1972-74 ended in 1975 (tables 6 and 7). Total U.S. exports to China in 1975, at \$303.6 million, were down 63 percent from the 1974 level. This drop was due entirely to an 88-percent fall in agricultural exports. Nonagricultural exports, mainly machinery and equipment and industrial items, increased 45 percent.

Total U.S. imports from China in 1975 rose 38 percent over 1974 levels to \$158.3 million. Imports of agricultural products (0.3 percent of total U.S. imports of agricultural products) increased 7 percent to \$28.2 million. But the share of agricultural products in total imports from China slipped to 18 percent in 1975 from 23 percent in 1974 (see table 10 for a breakdown of U.S. agricultural imports from China).

The large U.S. grain sales to China in 1973 and 1974 (table 4) grew out of abnormally high grain import demand caused by a poor harvest in the PRC in 1972 and apprehension in early 1974 about the size of the 1974 harvest. With import demand falling in late 1974 and 1975, China's grain requirements were met within the framework of the long-term agreements with Canada and Australia, and the United States bore the brunt of the reduced purchases. Political factors and problems with the quality of some U.S. grain shipments may also have contributed to the drop in the purchase of U.S. grain.

The only significant U.S. agricultural export to the PRC in 1975 was cotton. A total of 265,000 running bales was shipped during the year, 66 percent below the 1974 level of 785,000 bales. All cotton shipped in 1975 was contracted for in previous years. Additional contracts for more than 200,000 bales were terminated in February 1975 as the PRC trimmed cotton imports.

### Trade Prospects

Much of the 1975 pattern of PRC trade should be repeated in 1976. Continued efforts to promote and expand exports can be expected, as can

Table 10.--United States: Major agricultural imports from the People's Republic of China, 1972-75

Commodity	Unit	Quantity					Value				
		1972	1973	1974	1975	1972	1973	1974	1975	1,000 dollars	
Meats, n.e.s., fresh, chilled, frozen	lb.	110	428	505	1,761	31	192	274	860		
Eggs, not chicken, whole	doz.	44	64	106	297	40	76	137	312		
Seeds for planting	lb.	--	22	166	671	--	4	44	196		
Vegetables, fresh, chilled, frozen	do.	220	571	560	762	53	122	162	280		
Vegetables, dried, dehydrated	do.	501	248	1,460	653	169	177	869	412		
Vegetables, packed in salt, brine, pickled, or prepared	do.	306	666	691	1,726	89	224	240	467		
Mushrooms	do.	137	210	210	66	85	120	118	61		
Nuts, edible	do.	1,621	1,317	489	1,706	566	773	328	1,039		
Fruits, edible, fresh, dried, preserved	do.	161	395	719	930	86	165	304	507		
Honey	do.	270	621	946	459	61	230	360	152		
Tea	do.	837	1,279	2,736	4,608	299	613	1,017	1,979		
Cassia and cinnamon spices	do.	2,589	1,357	805	2,319	1,730	1,097	808	1,154		
Other capsicum, cayenne red pepper	do.	289	1,571	3,133	3,971	117	315	999	1,365		
Other spices and spice seeds	do.	175	204	413	1,637	67	49	166	512		
Tobacco, unmanufactured	do.	--	13	520	1,542	--	5	434	1,120		
Tung oil	do.	--	5,721	346	6,413	--	705	102	1,580		
Other vegetable and nut oils	do.	10	35	893	580	5	23	234	325		
Food preparations	do.	1,060	965	1,191	2,094	269	386	562	872		
Feathers and down	do.	481	1,054	1,017	2,372	735	1,728	1,949	3,255		
Bristles, crude or processed	do.	1,176	1,110	1,129	647	6,741	5,144	5,925	3,294		
Hair, horse, cattle, coarse animal	do.	374	156	156	156	665	383	535	550		
Hair, camel	greasy lb.	444	469	412	254	262	334	672	465		
Hair, cashmere, goat	do.	219	350	258	265	270	507	695	478		
Silk, raw	lb.	299	432	206	353	2,421	4,394	2,576	3,039		
Drugs, natural	do.	68	80	110	143	213	466	525	646		
Essential oils	do.	177	1,057	1,502	553	303	1,545	4,048	2,013		
Gelatin, inedible	do.	6,816	8,623	3,609	440	873	1,255	1,189	370		
Other agricultural commodities	do.	--	--	--	--	266	599	1,132	890		
Total agricultural commodities						16,416	21,631	26,404	28,193		
Total nonagricultural commodities						16,006	43,269	88,296	130,147		
Total imports						32,422	64,900	114,700	158,340		

-- = none or negligible. Sources: U.S. Department of Commerce, Bureau of the Census, U.S. Agricultural Imports, country by commodity, 12/31/73, 1/1/75, 12/31/75; U.S. Department of Commerce, Bureau of the Census, U.S. Foreign Trade, Highlights of Exports and Imports, FT 990-75-12, Table I-4A; U.S. Department of Agriculture, Economic Research Service, U.S. Foreign Agricultural Trade Statistical Report, calendar 1973 and 1974 issues.



attempts to limit imports where possible in order to further reduce the balance-of-trade deficit and ease foreign exchange pressures. The heaviest cuts will again be in agricultural products.

The upswing in the world economy should help PRC efforts to expand exports. However, problems will arise in several areas. PRC rice exports are expected to fall even further this year because of reduced world demand, increased competition from other suppliers, and low world market prices. Exports of certain products, such as cotton textiles and silk, are facing the possibility of quotas or other restrictions in major export markets. Finally, problems have arisen with petroleum sales to Japan, China's major market, as Japanese buyers are seeking a slower rate of growth of petroleum imports than has been previously projected. After several years of rapid expansion, China's crude oil exports may drop in 1976. As a result, no great rise in exports is projected and little growth of imports is expected.

Prospects for U.S. agricultural sales to China during 1976 are limited. Contracts concluded with Canada and Australia in early 1976 provided for an additional 1.7 million tons of wheat to be delivered during the year (table 5). With a carryover from the 1975 contracts of about 0.4 million tons, grain deliveries of about 2.1 million tons are contracted for fiscal and calendar years 1976. Barring a poor 1976 harvest, PRC grain imports are not likely to exceed the amount already contracted. With probable 1976 grain imports less than 30 percent of the peaks of 1973 and 1974 and less than half of the 1966-71 average of 4.3 million tons, the possibility of new U.S. grain exports in 1976 is limited. The 3-year agreements with Canada and Australia expire at the end of 1976. In the event these are not renewed, some sale of U.S. grain to the PRC for 1977 delivery is possible. However, as long as total PRC grain imports remain at current levels, substantial sales are unlikely.

In view of the substantial increases in soybean production during the past 3 years, no significant PRC soybean imports are expected in 1976.

Cotton appears to offer the best prospects for new U.S. sales in 1976. An upswing in world demand for PRC textile exports coupled with the decline in 1975 cotton production in China has led to a sharp drop in PRC cotton exports in recent months and an upswing in imports. This raises the possibility of some cotton purchases from the United States later in the year. (Frederic M. Surls)

#### OUTLOOK FOR 1976

Prospects for agriculture in the PRC in early June 1976 are mixed, due primarily to unfavorable weather in some of the more important cropping areas. Heavy rainfall in much of North China during fall sowing of winter wheat, the dry winter with little snow cover in the more northern parts, and cold spells during spring probably affected wheat stands. Although there is no evidence of excessive winter kill due to frost, there was a need for early irrigation in many sections of the North China Plain. Nevertheless, the effect of weather on yields may have offset the gains expected from increased acreage, resulting in a winter wheat crop about the same or possibly less than the record 1975 crop.



Prolonged dry conditions in Northeast (Manchuria) and Northwest China delayed the planting of spring wheat and resulted in a drop of spring wheat acreage from the 1975 level. In some areas, it was necessary for initial irrigation to facilitate land preparation for planting. Dry weather in other spring wheat areas also had a depressing effect in the earlier part of the cropping season.

The cropping areas of Northeast and Northwest China received above normal amounts of precipitation in late April and through much of May. Although not sufficient to restore normal levels of soil moisture, this precipitation gave a big boost to crop growth and brightened the prospects on an otherwise questionable crop. The heavy rains in late May in Heilungkiang Province further heightened prospects for the spring wheat crop, but the cutback in acreage may reduce that crop. Therefore, prospects for the total wheat crop have diminished from earlier expectations and total 1976 wheat production probably will not equal last year's record.

Growth of barley, pulses, rapeseed and other fall-sown crops which are grown in the southern sections of China, has been retarded because of excessive rain and cold during the spring of 1976. The acreage of rapeseed was again expanded significantly, but cold weather may have reduced yields. Acreages of winter wheat and other summer harvested crops reportedly increased 667,000 hectares in 1976, which compares with an increase of 133,000 hectares in 1975. Much of the 1976 expansion may have been planted to catch crops in the southern part of the country.

On the basis of a recent weather-crop analysis, it is questionable if the output of total winter sown crops can equal the record output in 1975.

The other major grain crop included in the early grain harvest is early rice, grown primarily in southern China. Weather similar to that in the spring of 1975 was a factor during land preparation, planting, and transplanting. Generally, above normal precipitation in many parts of the early rice area, along with low temperatures and an extended period of cloudiness, caused rotting of seedlings and slow growth. By early June 1976, after very intensive efforts, Kwangtung Province, the largest producer, and Hunan Province reportedly completed transplanting of early rice on a larger area than in 1975. However, the lateness of the crop is expected to have an effect on the follow-up late rice crop, whose maturity date may extend well into the frost period in the fall. Furthermore, stands were spotty in many of the areas affected by the weather. Nevertheless, the early rice crop, still a question, could improve substantially under present warming conditions. But belated transplanting and poor stands in some areas cloud prospects for that crop. Transplanting of early rice in Kwangtung Province, for instance, was still 10 percent below the acreage goal as late as the end of April.

The aggregated acreages of the early harvested grains (representing about 40 percent of the total grain output) appear to exceed those in 1975 despite the cutbacks mentioned. The massive (largest ever) farmland improvement and capital construction activity in agriculture--with emphasis on increasing the irrigation potential--from September 1975 through March 1976 should compensate for some of the negative effects of the weather earlier in the spring. Even

so, reduced yields may negate the advantages of the increased acreages. Thus, the total early grain harvest now appears less likely to equal the level of last year.

The outlook for the late grain harvest has improved somewhat due to widespread rain and increased use of irrigation facilities in the dryer areas. Although reports are sketchy, indications are that most autumn harvested grains and soybeans were planted on time and under more favorable conditions than spring wheat. But favorable weather, increased agricultural inputs, and intensified cropping practices will be required if the PRC is to equal or surpass the estimated record 280 million-ton grain crop (including 10 million tons of soybeans) of 1975.

Other crops, including cotton, bast fibers, sugarcane, tea, and tobacco were reportedly planted on time and are progressing well. Acreage of cotton may have been increased because of the reduced crop in 1975.

It is expected that livestock and poultry production will continue to increase following good progress in 1975. The push toward collectivized production of hogs is expected to continue in 1976.

Despite the change of leadership, the Government probably will continue to make concerted efforts to maintain a stable situation in the countryside. The supply of inputs reportedly has been increased for this year's farming campaign, the first year of the fifth 5-year plan.

Over the new 5-year plan period (1976-80), as in the one just completed, the PRC will be faced with the problem of raising agricultural production at a faster rate than in the previous 5-year period. There are likely to be further substantial increases in irrigated area, multiple-cropping, new seed strains, production of chemical fertilizer, and agricultural chemicals. In addition, the next 5 years have been designated in the National Conference on Learning from Tachai in Agriculture as the period for completing the basic mechanization of agriculture.

For chemical fertilizer, the installation of 13 large synthetic ammonia and urea plants purchased by the PRC in 1973 seems to be ahead of schedule. Several of the 13 plants may be in production by the end of 1976. These new plants, together with a tight foreign exchange situation and other factors, have already affected the PRC's 1976 imports of nitrogenous fertilizer.

The Government also intends to further tighten control of the peasant labor force and management at all levels, according to plans presented at the National Agricultural Conference. The enormity of the national organization, as well as the size of inputs used, are an indication of the PRC's effort to develop agriculture to the level at which the country can further expand industry.

While much has been done by the Chinese regarding agricultural extension work and substantial use of inputs, little effort has been devoted to the longrun development of advanced scientific research, which is essential to efficient utilization of inputs to realize the full potential of agricultural.



This is considered by most of the scientific delegations who visited China as one of the problematic weaknesses in the PRC's agricultural development.

The foreign trade pattern in 1975 is expected to remain about the same in 1976. China's record harvests in 1974 and 1975, and the continued tight foreign exchange situation, probably point to continued limited imports of agricultural products in 1976. Purchases so far in 1976 of 700,000 tons of wheat from Australia and 965,000 tons of wheat from Canada are both below the minimum tonnage of the three-year agreements with these countries. Imports of corn in 1976 will be small because of increases in domestic output in recent years. In 1975, China returned to a net export position in soybeans, and will probably remain so in 1976, but at a lower level.

Unless weather is exceptionally bad in China this year, prospects are dim for U.S. agricultural exports to the PRC in 1976. So far, there are no indications of any wheat purchases. Imports of U.S. corn and soybeans are also likely to be almost nil. With the upturn of the world textile market, cotton will probably be the only U.S. agricultural export to the PRC in 1976.

PRC farm product exports to the United States are expected to continue to increase at a steady pace in 1976. (Marion R. Larsen and Charles Y. Liu)

## **MONGOLIAN PEOPLE'S REPUBLIC**

The agricultural situation in Mongolia in 1975 was below expectations in terms of both the annual plan and the wind-up year for Mongolia's fifth 5-year plan (1971-75). The value of agricultural output for the 5-year plan was to increase 22 to 25 percent, and the 1975 plan called for a 10.2 percent increase. Neither of these goals was attained, but progress was made. A 17.3-percent increase over the previous plan was claimed in a summary report for 1975, but no mention was made of the fulfillment of the agricultural goal for 1975. The 5-year production goal for grain reportedly was exceeded by 4.5 percent.

To satisfactorily complete the agricultural goal for 1975 and thereby successfully fulfill the 5-year plan goal, it would have been necessary to increase grain production 16 percent, green fodder production by 40 percent, potatoes by 87 percent, vegetables (minor crops) by 42 percent, and fodder for winter feeding by 12 percent. The livestock sector was expected to have a net increase in young livestock of 9 million head in 1975. This increase was necessary to meet the 5-year plan goal of bringing the total net number of livestock (after annual production of livestock products) up to 25 million. 30/

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30/ Mongolia aggregates all categories of livestock in a total number rather than aggregating them in terms of animal units. The official livestock numbers for 1974 equal a rounded total of 24.3 million head; camels, 606,000; horses, 2.26 million; cattle, 2.36 million; sheep, 14.50 million; and goats, 4.57 million.



Plan fulfillment was spotty in 1975. The grain production goal was substantially overfulfilled because of a near-record crop, but that for potatoes and vegetables was only partially met. It was admitted in a year-end report that the goal for certain categories of livestock (camels, horses, and cows) and livestock products (meat, milk, and wool) would not be met.

Although surpassing 1974 levels by less than planned amounts, increases in industry (accounting for about 30 percent of national income) along with increases in output from forestry, trade (both internal and external), and construction compensated for the shortfall in agriculture. Mongolia claimed an increase of 6.2 percent in national income, compared with the planned 5.9 percent. With a critical and more long-range view toward the main agricultural sector, however, Mongolian officials concluded the year by calling for expansion of the cultivated area, improvement of needed inputs, and strenuous efforts to increase fodder supplies.

In the vital livestock sector, which constitutes 80 percent of the value of agricultural output and about 60 percent of the national income, only 8.69 million head of young livestock were raised--96.6 percent of the 1975 goal. Harsh April weather and neglect were responsible for the poor results. Officially, livestock numbers increased 7.8 percent during the 5-year plan. The calculated number of livestock, therefore, for 1975 was 24.19 million head, 810,000 head short of the 25 million goal and 120,000 fewer than at the end of 1974.

Total crop production in 1975 exceeded that for 1974, the result of a good grain harvest. The harvest of 549,000 tons of grain (wheat, barley, oats) from 430,000 hectares (representing one of the country's highest yields) was 20 percent above the plan, according to official reports. No report was made on the production of green fodder (pasture), but output of hay increased by 21 percent, and procurement was almost 25 percent more than in 1974.

Mongolia lists trade relations with some 200 firms in 20 countries, but the major portion of trade is still with the Soviet Union (80 percent) and other members of the Council for Economic Mutual Assistance (CEMA) (15.5 percent). In 1975, a small amount of specialty trade again took place with the United States. Mongolia shipped more than \$1 million worth of cashmere and camel hair to the United States. The United States did not export any agricultural commodities to Mongolia.

On the input side, Mongolia is devoting efforts to expansion of irrigation and building of water conservancy projects. Construction of livestock shelters is likewise receiving greater support, as is the accumulation of increased fodder reserves. A meeting of specialists in October emphasized the need to develop better long-range weather forecasting.

Plans for 1976 call for the raising of 9 million head of young livestock of all kinds to bring total livestock up to 25 million head. An increase of 4.3 percent is projected for gross agricultural production and an increase of 9.6 percent in the national income. Crops are to be planted on an excess of 530,000 hectares, which will include 40,000 hectares of virgin land earmarked for development during 1976. The bulk of this land will be utilized for grain and fodder crops.

The goals for agriculture in 1976, although modest, will require a substantially greater effort than in the past, since it will be necessary to make up for shortfalls in the 1975 livestock sector. Reaching the 25-million-head goal for total livestock on the basis of raising 9 million additional young animals in 1976 could be accomplished only by diverting animal products from consumption, thus allowing further herd expansion. This goal level has not been attained in the past, but if weather remains favorable, the possibilities of attaining the goal will increase, due to improved conditions in fodder and grain production, pasture improvement, and increased facilities for housing livestock and better veterinary service. (James R. Scullen)

## DEMOCRATIC REPUBLIC OF VIETNAM

### ECONOMIC HIGHLIGHTS

The 3 years of rehabilitation and development of the economy of North Vietnam closed on an optimistic note following a good, but not an outstanding, year in agriculture in 1975. In a year-end report to the National Assembly, Deputy Premier Le Than Nghi stated that "North Vietnam had, by the end of 1975, completed its postwar economic rehabilitation." However, it was pointed out that although production over the past 3 years had developed at a fairly high rate, it had not yet caught up with the rate of population growth, so that average per capita production of most of the important products had not reached the pre-Vietnam War (1965) level. Shortcomings in economic leadership and management were noted as limiting factors.

Officials further claimed that by late 1975, the production capacity of many war-damage segments of the industrial sector had increased over prewar levels. These segments, many of which are related to agricultural production, include electricity, coal, engineering, fertilizer, and textile industries. Local industries also were making progress. However, it was observed that progress was lagging behind plans in the construction of machinery works, power networks and transformer stations, coal mining projects, warehouses, and in housing and other welfare projects. Lack of progress in the construction industry reportedly affected the implementation of plans in other sectors of the economy.

The official appraisal of the North Vietnamese economy in 1975 was that "it continued to develop at a fairly high rate." Economic indicators include a claimed national income increase of 10 percent, with an increase in gross national product of 11 percent. Total industrial output was up 17 percent, fertilizer production increased 22 percent, goods turnover was up 10 percent, and state-run enterprises registered a 16-percent increase. The value of animal husbandry was substantially higher for the first time in many years, despite continued problems with feed and diseases. Exports exceeded the previous record (1964) by 25 percent, but the country's huge import needs resulted in a large trade deficit. Special efforts were made during the past 2 years to increase exports of agricultural, sea and forestry, light industry, and handicraft products. Handicrafts and food processing gained significantly during the year. Only the output of timber, cement, writing paper, and sugar was said to be below the prewar level.



## AGRICULTURAL PRODUCTION

The situation in agriculture was mixed in 1975. Successes in 1974 prompted the setting of even higher goals for production in 1975, but many of them were not attained. <sup>31/</sup> Progress was made in expanding the area for most crops and in producing and distributing inputs. Efforts to increase output in the livestock sector proved successful for the first time in many years. Measures also were taken to expand the acreage of tropical and semitropical fruits. Despite these efforts and an increase in the application of inputs, agricultural production did not attain the level of the previous year, nor was the rate of growth as high.

As a result of continued consolidation, the number of collectives has declined from 19,900 in 1972 to 17,900 in 1975. The proportion of peasant families in collectives increased from 94.5 percent in 1973 to 95.2 percent in 1975. Increased emphasis was placed on developing agricultural zones (in which certain or specialty crops adaptable to weather and soil conditions flourish) and expanding farming areas into the upland and mountain areas, where cultural practices vary distinctly from those in the low-lying delta areas. No indication of the success of this movement has surfaced, but claims were made of increased acreages (some substantial) of potatoes, corn, manioc, beans, and some industrial crops, all of which adapt much better than rice to the higher and drier areas.

### Crop Production

Output of most crops in North Vietnam in 1975 did not reach the level set in the state plan, despite an increase in the acreage of most of the major crops. Production shortfalls occurred for rice, subsidiary crops, and some industrial crops. It is unusual for production of both the early and late rice crops to decline in the same year, but this did occur in 1975. Special efforts were made to increase the acreage of subsidiary crops, especially potatoes, corn and vegetables, particularly in industrial areas.

The planting plan was overfulfilled for both the early and late rice crops, and the total planted area exceeded that of 1974. The official assessment was of a total rice crop exceeding that for 1965. Thus, the 1975 rice crop was larger than the officially estimated 4.51 million tons of 1965, but probably smaller than the 4.54 million tons of 1962, or about 4.52 million tons. This estimate was about 7 percent below the good 1974 crop of 4.84 million tons.

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<sup>31/</sup> Goals set for 1975 included an 8.6-percent increase in the value of total agricultural output (6.5 percent for crops and 16 percent for livestock; 5 to 6 percent for grain production; 40 percent for subsidiary crops; 3 percent for hog numbers; a slight increase in the number of buffalo and cattle; and a 14-percent increase in meat).



The early rice crop is comprised of the traditional fifth-month rice crop and the spring rice crop; the latter is an early variety now planted on 70 percent of the early rice area. <sup>32/</sup> Unfavorable weather affected the spring rice crop ("unprecedented in previous years"), reducing it to an average crop that was substantially below the near-record crop of 1974. Weather also adversely affected the late rice crop (comprised of an increasing area of early autumn rice and the traditional tenth-month crop, which is harvested late in the fall and early winter). A prolonged dry period (2 months) after the transplanting of the tenth-month crop, followed by torrential rains and typhoons shortly before harvest, reduced the output below the record late rice harvest in 1974, the best rice crop since 1950. Despite the unfavorable weather, the tenth-month crop ranked second to the record crop in 1974. Estimated area, yield, and production of rice in North Vietnam are shown in table 11.

Production of other food crops, referred to as subsidiary or secondary crops (corn, beans, sweet potatoes, and manioc--most of which are grown in the same time span as the early rice crop), also was affected by the winter. Production did not attain planned goals and "was generally weak."

Not enough information was available to assess the production of oilseeds, soybeans, and industrial crops (cotton, tea, coffee, sugar, and tobacco). Since most of these are summer grown crops, they would have been similarly affected by the weather as the tenth-month crop. The lack of an official assessment may be interpreted to mean that output was only mediocre. These crops have retained only minor significance in North Vietnam because Government policy has given greater priority to food crops. At no time has the production of any of them come near to meeting domestic requirements. Their role is expected to increase, however, with the renewed emphasis on greater diversification of agricultural production.

### Livestock

The total value of livestock production reportedly increased 16.7 percent in 1975 (table 12). This significant increase represented a 1.8-percent increase in buffalo numbers and a 2.6-percent increase in oxen (cattle) numbers--first gains in 10 years for both categories, according to official claims. Greater emphasis was placed on increasing the number of milk cows and poultry in 1975. This action may have accounted for the turnabout in the number of cattle in 1975. No information was available on the situation in poultry. Hog numbers increased 3.2 percent, 1.9 percent above plan norms. Hogs numbered 6.5 million head according to the official inventory on October 1, 1975.

The average delivery weight for marketable hogs to the state was only 40.9 kilograms, live weight, in 1975, but even this represented an increase. North Vietnam's present approach to solving their livestock problems is through the

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<sup>32/</sup> The early rice crop constitutes over 40 percent of total rice production.

Table 11--Democratic Republic of Vietnam: Area, yields and production of rice, 1939, 1955-75, and 5-year averages, 1955-75 1/

Year	Area	Yield	Production
	<u>1,000 hectares</u>	<u>Kg./ha.</u>	<u>1,000 metric tons</u>
1939 .....	1,840	1,308	2,407
1955 .....	2,176	1,619	3,523
1956 .....	2,284	1,811	4,136
1957 .....	2,192	1,801	3,948
1958 .....	2,235	2,048	4,577
1959 .....	2,274	2,284	5,193
1960 .....	2,284	1,844	4,212
1961 .....	2,410	1,930	4,651
1962 .....	2,413	1,882	4,542
1963 .....	2,364	1,817	4,296
1964 .....	2,426	1,860	4,512
1965 .....	2,330	1,936	4,511
1966 .....	2,270	1,806	4,100
1967 .....	2,256	1,773	4,000
1968 .....	2,250	1,689	3,800
1969 .....	2,200	1,919	4,000
1970 .....	2,200	1,909	4,200
1971 .....	2,100	1,667	3,500
1972 .....	2,200	2,118	4,660
1973 .....	2,200	1,818	4,000
1974 .....	2,240	2,161	4,840
1975 .....	2,250	2,010	4,520
1955-59 .....	2,232	1,915	4,275
1960-64 .....	2,379	1,868	4,443
1965-69 .....	2,261	1,805	4,082
1970-74 .....	2,188	1,938	4,240

1/ Data for 1939 and 1955-65 are from official sources. Data for 1966-75 are ERS estimates based on official reports and statements.

Table 12--Democratic Republic of Vietnam: Numbers of major livestock, 1939, 1955-75, and 5-year averages, 1955-75 1/

Year	Buffalo	Cattle	Hogs
	<u>1,000 head</u>		
1939 .....	788	563	2,255
1955 .....	1,084	756	2,137
1956 .....	1,165	834	2,500
1957 .....	1,238	906	2,950
1958 .....	1,376	990	3,985
1959 .....	1,447	927	3,626
1960 .....	1,451	879	3,751
1961 .....	1,450	781	3,740
1962 .....	1,488	786	4,239
1963 .....	1,508	796	4,208
1964 .....	1,565	819	4,525
1965 .....	1,609	809	4,750
1966 .....	1,658	802	5,100
1967 .....	1,641	778	5,200
1968 .....	1,615	692	5,230
1969 .....	1,651	691	5,280
1970 .....	1,650	690	5,400
1971 .....	1,650	690	5,500
1972 .....	1,650	690	5,640
1973 .....	1,650	690	6,150
1974 .....	1,650	690	6,300
1975 .....	1,680	708	6,500
1955-59 .....	1,262	883	3,040
1960-64 .....	1,492	812	4,093
1965-69 .....	1,635	754	5,112
1970-74 .....	1,650	690	5,798

1/ Data for 1939, 1955-65 are from official sources. Data for 1966-75 are ERS estimates based on official reports and statements. For the period 1970-74, officials stated that buffalo and cattle numbers were stagnant and that the increase in 1975 was the first in 10 years. However, other sources show a different (mixed) situation for buffaloes during 1965-69.



collective raising of livestock. About half the collectives presently raise livestock. The proportion of total livestock in the collectives and the degree of success in collective livestock raising are not known.

## POLICY AND AGRICULTURAL INPUTS

The implementation of North Vietnam's policy to increase agricultural production in 1975 fell short of expectations, but this may have been due as much to unrealistic goals as to unfavorable weather and other variables. The rehabilitation program called for massive inputs, many of which are beyond the country's capabilities at this time. However, good progress was made in expanding irrigation facilities, in the production of chemical fertilizers and agricultural chemicals, in the mechanization of certain agricultural operations, and in plant and animal breeding. The volume of agricultural inputs has increased seven-fold since 1960. Multiple-cropping was claimed to have increased from a coefficient of 1.45 in 1955 to 1.75 in 1974, and increased further in 1975. This increase probably includes only irrigated land. The effect of these inputs has resulted in average yield increases in excess of 500 kilograms of rice per hectare, or a gain of about 33 percent under Communist rule. North Vietnam produced nitrogen fertilizer for the first time in 1975. The country's phosphate fertilizer capacity reportedly was restored by late 1974. The availability of electricity for use in agriculture reportedly increased 40 percent over 1974 and three times over 1973.

## AGRICULTURAL TRADE

North Vietnam's foreign trade data remains a state secret. Data from other sources, however, indicate that trade increased significantly again in 1975. The value of imports continued to far outweigh that of exports, particularly with respect to agricultural products, most of which are food items. Grains, particularly rice, continued to be the major agricultural import. Table 13 shows the major agricultural imports and exports in recent years.

Efforts to close the gap between imports and exports during the rehabilitation period have not been successful because of the great need for equipment, machinery, spare parts, raw materials, and fuel to support the rehabilitation program. This pattern of imports is to continue into the new second 5-year plan period (1976-80), but imports of consumer goods are to be curtailed and the export quota for 1976 is to be increased by 12 percent over that of 1975. The targeted increase represents a substantial rise in exports when it is considered that exports in 1975 exceeded the 1964 exports--the previous record--by 25 percent. Most of these exports will be from the agricultural sector. Thirty percent are to be raw and processed agricultural produce and 55 percent are to be products of light industry and handicrafts, a large proportion of which are derived from raw farm products.

Production of crops, particularly grains, is to be accelerated so that in 3 to 4 years, domestic production can provide for the food needs of the

Table 13--Democratic Republic of Vietnam: Major agricultural imports and exports, 1961-65 average, annual 1968-74

Commodity	1961-65 average	1969	1970	1971	1972	1973	1974
<u>1,000 metric tons</u>							
Imports:							
Grains .....	49.6	1,609.5	1,481.8	1,668.5	1,377.8	1,749.1	1,827.8
Rice <u>1/</u> .....	18.0	1,290.0	890.0	1,250.0	1,100.0	1,400.0	1,100.0
Wheat and flour <u>2/</u> :	13.7	312.5	591.8	418.5	277.8	349.1	727.8
Sugar, raw .....	<u>3/</u> 26.2	60.1	57.6	92.3	81.1	87.0	54.4
Animal fats <u>4/</u> .....	0.4	2.0	2.0	2.0	2.0	1.9	NA
Coconut oil .....	NA	0.3	0.6	1.5	1.5	1.8	1.8
Milk, condensed .....	NA	1.2	1.0	0.8	0.8	0.9	0.9
Milk, dry .....	NA	1.0	1.0	1.0	0.4	0.4	0.4
Cotton .....	1.1	3.0	3.0	3.0	3.0	3.0	3.0
Rubber, natural <u>5/</u> ..	2.6	1.5	1.0	1.0	1.0	1.0	1.0
Exports:							
Rice .....	10.9	20.1	18.5	20.0	20.0	20.0	20.0
Bananas .....	7.4	0.4	2.6	2.4	2.5	2.0	2.0
Tea .....	0.8	1.6	1.8	1.7	1.8	1.9	2.0
Peanuts (shelled) ...:	2.0	1.1	3.5	2.0	1.0	1.0	1.0
Oilseed cake .....	0.4	0.4	0.7	0.8	0.8	0.8	0.8
Sugar, raw .....	NA	6.8	2.0	15.0	10.2	4.1	4.3
Sweet potatoes .....	NA	0.3	0.4	0.4	0.7	0.8	0.8
Peanut oil .....	NA	0.9	1.2	1.4	1.5	1.5	1.5
Coffee .....	NA	1.5	1.8	1.5	1.5	1.5	1.5
Jute .....	NA	1.9	3.7	1.6	1.5	1.5	1.5
Pigs (thousand) .....	NA	NA	NA	NA	10.0	38.0	60.0

NA = Not available.

1/ This is a new series compiled by the Food and Agriculture Organization of the United Nations. It appears more reasonable than official claims of food imports, which are considerably smaller. Imports in 1975 probably were not as large as in 1974. The 1961-65 average is from FAO's old series.

2/ In wheat equivalent.

3/ Average for 1962-66.

4/ Lard and other rendered pig and poultry fat.

5/ Average for 1964-66.

Source: The Food and Agriculture Organization of the United Nations, Rome: Trade Yearbook, Vol. 28, 1974.

population. Agricultural output is to be diversified to include a larger portion of industrial crops as the raw materials for light industry and to eventually provide a level of agricultural exports large enough to finance agricultural imports. 33/

## OUTLOOK

As of mid-April 1976, the outlook for the current crop year in North Vietnam was more promising than a year earlier, although the 1975 outlook was also promising until unfavorable weather affected the major rice crops and the winter-spring subsidiary crops. Cold weather in January 1976 reportedly damaged 20 to 30 percent of the earlier transplanted acreage of rice seedlings for this year's fifth-month and spring rice crops. Although only a small portion of the area has been transplanted, there was sufficient time to plant additional seeds and replace the plants in affected areas, but with poorer quality seeds. The transplanting goal was belatedly overfulfilled by mid-April. 34/ However, the goal for corn and potatoes fell "considerably short."

Special emphasis has been placed on expanding the early rice, subsidiary, and industrial crop acreages. A report on March 20, 1976, stated that acreage of subsidiary, vegetable, and industrial crops has been increased by 21 percent compared with 1975. The goal is to increase total grain acreage by 15 percent in 1976 (of which the main component, rice, is to be increased by 13 percent) and that of subsidiary crops by 26 percent. 35/ These goals obviously were set high because of the disappointing output in 1975, and also because 1976 is a catch-up year. Furthermore, since 1976 is the first year of the new 5-year plan, there is the inherent desire to get off to a good start.

Major emphasis is again directed to increasing the acreage of corn, manioc, beans, vegetables, sweet potatoes, and industrial crops. Continued modest increases are planned in the livestock industry for 1976: 3-percent in hog numbers, 12.5-percent in pork production, 14.6-percent in poultry numbers, 19.6-percent in egg production, and 3-percent in buffalo and cattle numbers, with special emphasis on increasing the number of milk cows. But many problems associated with animal diseases and feed remain to be solved. Fishery output is to increase 22 percent.

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33/ These include grain, vegetable oil, vegetables, meat, fish, eggs, sugar and fruit.

34/ The fifth-month and spring rice crops together occupy about 1 million hectares (roughly 45 percent of the total rice acreage).

35/ The goal of 5.5 million tons was set at the National Assembly on Dec. 23, 1975. At that same meeting, it was reported that the 1975 rice crop did not attain the planned norms and that total rice output exceeded that of 1965, which was officially designated as 4.51 million tons. A 13-percent increase to 5.5 million tons implies a figure of 4.87 million tons for 1975. Further research is needed to resolve this discrepancy.



The 1976 goals for agriculture are ambitious. With favorable weather and the potential for a better organized and larger labor force for the first time in a decade (under peacetime conditions), considerable advancement is probable. Higher agricultural output is likely due to increasing use of agricultural inputs such as chemical fertilizer, agricultural chemicals, irrigation and drainage facilities, expanded acreage of most crops, improved crop varieties and an enlarged mechanization base. Major limiting factors are the continued low level of managerial and organizational abilities of the cadres and the low labor output of the peasants.

Little has been said about goals for the new 5-year plan. This may be due partly to the decision to include the entire country (North and South Vietnam) in the 1976-80 plan, a late decision which probably required revision of many plan goals. One announced goal was the complete mechanization of all the plains area in North Vietnam. Another goal, not necessarily tied to the 5-year plan, but one that will greatly affect the outcome of agricultural production, is the completion of a vast irrigation network providing irrigation and drainage facilities for 900,000 hectares of cropland in the main rice growing areas. This 3-year project is scheduled for completion by the end of 1976, but a massive effort will be required. (Marion R. Larsen)

## NORTH KOREA

Both the total economy of North Korea and its agricultural sector, one of the major economic components, failed in 1975 to sustain the unusually rapid expansion of 1974. Large trade imbalances placed a heavy strain on the country's credit, and output of the agricultural sector failed to reach targeted goals. A new record was set in grain production, however, but the targeted goal was not attained and the rate of increase was only a third of that in 1974. Production of industrial crops, vegetables, fruits and sericulture also was up. Yields of most crops continued to increase, while efforts to expand acreage of the most important crops produced only limited results. North Korea's main thrust to increase agricultural production is through intensive cultivation.

The grain production goal set at the Agricultural Congress in January 1975 was to achieve a 1-million ton increase over the 7-million ton record in 1974. The goal was only 70 percent fulfilled. According to official reports, output, reported at 7.7 million tons, was up only 10 percent, compared with the claimed 30-percent increase in grain production in 1974. Both major grain crops, rice and corn, were produced on slightly expanded area. Increased yields, due to heavier application of chemical fertilizer and improved cultural practices, contributed substantially to the rise in production. Barley and wheat production increased only slightly. No official mention was made of other crops traditionally included in the category of grain (millet, sorghum, pulses and soybeans). Nor was any claim made that the goal for rice (3.6-3.7 million tons) and corn (4-4.8 million tons) was attained. 36/

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36/ The goal for corn was highly speculative. It was based on the possibility of obtaining 100-120 grams per stalk of corn. Ambiguities were also noted in official claims of yields which, when applied to total acreage, gave an even larger distorted production figure.

Because of the concentrated efforts to increase production of rice and corn, the miscellaneous grains have declined in relative importance. The magnitude of these changes is difficult to determine because of the unreliability of official figures on yield and production.

In 1975, it is estimated that there was a modest increase in rice production (from 3.5 million tons in 1974 to 3.7 million tons) and a substantial increase in corn output (from an estimated 2.2 million tons in 1974 to 2.7 million tons). Acreages of these two major crops were about the same, but the increase in yields of corn probably was at a faster rate. Acreage of corn was placed at 680,000 chongbo. 37/

Developments in cultural practices and technical innovations, together with the high level of inputs mentioned above, account for the high yields. The use of cold-frame techniques to allow earlier planting of rice in seed beds and the mechanical transplanting of the total rice crop in 1975 (for the first time) resulted in considerably more growth time. Another innovation to gain more growing time in North Korea's short growing season was that, following germination of seeds in specially made humus (peat) pots, the entire acreage of corn was reportedly transplanted. In addition, it was claimed that the entire corn and rice acreage was completely irrigated, essentially all farm operations were mechanized, and at least 1 ton of chemical fertilizer (200 kilograms of nutrient weight) was applied per chongbo. 38/

Production of other grains probably remained at the 1974 level: about 600,000 tons of miscellaneous grains and about 700,000 tons of pulses and soybeans.

Notable increases were made in the production of vegetables and fruits. As a result of continuous development, production of vegetables allegedly reached 300 kilograms per capita in 1975. Production of fruit, especially apples, has increased. The number of nurseries and hothouses has increased and these enterprises are widely dispersed. Acreage of orchards increased to over 300,000 chongbo in 1975, and production of fruit was expected to reach 800,000 to 1,000,000 tons. The intensified use of greenhouses has made possible an increased flow of fresh vegetables to cities and industrial areas during the colder parts of the year. It has also been a major factor in the early germination of seed corn, thereby lengthening the season of growth for that crop.

No major policy changes affecting agriculture were made in 1975. It was reported that scientific farming was much enhanced by the establishment of an agricultural college and a branch of the Academy of Agricultural Science in every Province in 1975. Under the major policy of developing irrigation, mechanization, electrification and fertilization, substantial progress was

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37/ The chongbo is the designated unit of land in North Korea. It is equal to 0.99174 hectares or 2.45 acres.

38/ This claimed figure appears excessive and may include a mixture of fertilizer components. North Korea's generally hilly soils are shallow and infertile; they require large amounts of fertilizer.



made in increasing the input base for agriculture. In addition, land reclamation increased the area of cultivated land, rotation of crops was carried out more efficiently, and there were improvements in farm management and plant breeding. These developments were part of a program designed around the slogan of the "right crop in the right place at the right time."

The completion of the Sungri chemical complex in October 1975 reportedly provided enough chemical fertilizer to supply each planted chongbo with about 1,000 kilograms (gross weight). This supposedly also completes the goal of a 3-million ton annual capacity of chemical fertilizer by the end of 1975, so that total production in 1976 will be double the 1.5 million tons produced in 1970. As a result of improvements in management and increases in mechanization, it was claimed that in 1975 one worker could take care of 5-6 chongbo of paddy fields or 8-10 chongbo of non-paddy fields.

The increases in production and the developments in agricultural inputs in 1975 were largely tied to the goals of the not yet announced next long-term plan, the dates of which have not been announced. However, some of the goals include the production of 5 million tons of marine products, 5 million tons of chemical fertilizer, and 10 million tons of grain. Reclamation of 100,000 chongbo of tidelands is also planned. In addition, there is to be a substantial increase in the availability of farm machinery and tractors, so that the ratio of four tractors per 100 chongbo of cultivated land in 1975 will, in the near future, increase to 6-7 tractors per 100 chongbo. These developments are part of a general policy set forth a few years ago in which the Government promised peasant farmers a work day similar in scope and time to that of workers in the city and in industrial enterprises.

No significant information was released on livestock during the year. Very little progress appears to have been made in large livestock, since there is so little need for animal power in farming operations. The trend in recent years has been toward increasing the output of livestock products for domestic consumption. This included developing dairy herds, meat-type hogs for slaughter, and poultry for both eggs and meat. Modern facilities, including heated coops, for raising chickens during the winter were expanded in 1975, reaching the capacity of 100 million eggs annually. The absence of reports on plan fulfillment for other categories of livestock may indicate a poor performance. The livestock sector traditionally has been the weakest segment of North Korea's agriculture.

By the end of 1975, North Korea claimed trade relations with 120 countries. This represents a substantial increase from a few years ago, when the country's trading partners were made up primarily of friendly Communist countries. In 1974, North Korea's trade deficit was almost \$600 million. It appears to have increased in 1975. Exports in 1974 totaled about \$685 million and were comprised of minerals, chemicals, metallurgical products, chemical goods, fabrics and foodstuffs. Imports, totaling about \$1,260 million, were made up of machinery and equipment, petroleum, foodstuffs and cooking oil. As farm product exports continue to increase, more are entering export channels to industrial and developing countries in the Far East. Over half (52 percent) of total trade in 1974 was with non-Communist countries. Although trade returns are not available for 1975, it is probable that the country increased exports and decreased imports in an attempt to balance trade.



The outlook for agriculture in North Korea in 1976 is somewhat clouded. Despite the increased availability of inputs and the higher level of technology, no challenging goal was set for agricultural production in 1976. A March 7, 1976 editorial encouraged a "new upsurge in this year's agricultural production" and summarized the agricultural task discussed at a March 4 national meeting in Pyongyang in which a goal of 8,000,000 tons of grain was set for 1976. This represents less than a 4-percent gain over 1975 output and follows claimed increases of 10 percent in 1975 and 30 percent in 1974. Yet there are to be increases in the use of mechanization and chemical fertilizer, improvements in irrigation, and more efficient use of electrification in the countryside.

That the 1976 goal for grain production was reportedly attained in 1974 and that many other 1976 goals have already been attained suggests that premier Kim had in mind higher goals than suggested above. It is highly unlikely that any slippage in the rate of production would be allowed, given the reportedly highly developed agricultural production facilities that exist in North Korea. The production of chemical fertilizer is to increase 37 percent in 1976, even though the claimed average application in 1975 exceeded 1 ton per chongbo.

North Korean officials claim that a successful harvest is now guaranteed, regardless of adverse weather conditions. So far in 1976, as in 1975, cold, dry weather has pervaded much of the crop producing areas. However, with the advantages of technical developments, it is probable that North Korea's agricultural production not only will continue to expand, but that greater benefits will derive from further diversification of the crop and livestock sectors. Such progress appears to be essential in order to deal with the continued imbalance in foreign trade. (Marion R. Larsen)

Appendix table 1--People's Republic of China: Growth of total grain production, by province, municipality, and autonomous regions, 1974-75 1/

10-percent increase <u>2/</u>	5- to 10- percent increase <u>2/</u>	Less than 5-percent increase	No report: less than 1974 <u>3/</u>	Equal to 1974
Hupei	: Heilungkiang (5%)	: Anhwei	: Chekiang	: Hopeh
Kansu	: Hunan (6.5%)	: Fukien	: Honan <u>4/</u>	:
Shensi (about 10%)	: Kwangsi (5%)	: Kirin	: Inner Mongolia <u>4/</u>	:
Shantung	: Liaoning <u>5/</u>	: Ningsia <u>6/</u>	: Kiangsu <u>7/</u>	:
Shansi	: Tibet (8%)	: Peking	: Kwangtung	:
Sinkiang (15%)	:	: Kiangsi	: Kweichow	:
Tsinghai	:	:	: Shanghai	:
	:	:	: Szechwan	:
	:	:	: Tientsen	:
	:	:	: Yunnan <u>7/</u>	:
	:	:	:	:

1/ Data compiled from local and national news services

2/ Figures in parentheses are claimed percentage increases.

3/ Since no report was given, it is assumed that the 1975 grain harvest did not equal that of 1974.

4/ Information available to ERS regarding the 1975 grain harvest for Honan Province and for the Inner Mongolian Autonomous Region does not substantiate the information quoted by one other source which shows a bumper harvest for Honan Province and a 10-percent increase for the Inner Mongolian Autonomous Region.

5/ An increase of 850,000 tons of grain was claimed for Liaoning, an increase of nearly 10 percent over 1974.

6/ Total grain production on irrigated land increased 10 percent over 1974. The proportion of irrigated land to total cropland in Ningsai-Hui in 1975 was 25 percent (about 60,000 hectares) of the total cultivated area. It is assumed that total grain production probably decreased slightly.

7/ Yunnan Province initially reported increases in total farm output, which was shown to have exceeded that for 1974 by 10 percent in an earlier report. Later reports did not mention the grain harvest. An early report also gave a considerable increase in farm output for Kiangsu Province, but subsequent reports did not mention the grain harvest.

Appendix table 2 --People's Republic of China: Area, yield, and production of total grains, 1949-75, 5-year averages 1951-75 1/

Year	Total grain				Rice				Wheat				Miscellaneous grains 2/				Tubers 3/					
	Area		Pro- duction		Yield		Area		Pro- duction		Yield		Area		Pro- duction		Yield		Area		Pro- duction	
	Million hectares	Kg./ha.	Million tons	Million hectares	Kg./ha.	Million tons	Million hectares	Kg./ha.	Million tons	Million hectares	Kg./ha.	Million tons	Million hectares	Kg./ha.	Million tons	Million hectares	Kg./ha.	Million tons	Million hectares	Kg./ha.	Million tons	
1949	101.6	1,064	4/108.1	25.7	1,891	48.6	21.5	642	13.8	47.4	755	35.8	7.0	1,400	9.8	7.0	1,400	9.8	7.0	1,400	9.8	
1950	104.8	1,190	124.7	26.1	2,111	55.1	22.8	636	14.5	48.2	886	42.7	7.7	1,610	12.4	7.7	1,610	12.4	7.7	1,610	12.4	
1951	107.0	1,262	135.0	26.9	2,250	60.6	23.1	745	17.2	48.7	887	43.2	8.3	1,687	14.0	8.3	1,687	14.0	8.3	1,687	14.0	
1952	112.3	1,375	154.4	28.4	2,408	68.4	24.8	739	18.1	50.4	1,022	51.5	8.7	1,885	16.4	8.7	1,885	16.4	8.7	1,885	16.4	
1953	114.3	1,373	156.9	28.3	2,516	71.2	25.6	715	18.3	51.3	988	50.7	9.0	1,844	16.6	9.0	1,844	16.6	9.0	1,844	16.6	
1954	116.3	1,379	160.4	28.7	2,467	70.8	27.0	867	23.4	50.9	967	49.2	9.8	1,735	17.0	9.8	1,735	17.0	9.8	1,735	17.0	
1955	118.4	1,476	174.8	29.2	2,671	78.0	26.7	861	23.0	52.4	1,050	55.0	10.0	1,890	18.9	10.0	1,890	18.9	10.0	1,890	18.9	
1956	124.3	1,468	182.5	33.3	2,474	82.4	27.3	908	24.8	52.7	1,013	53.4	11.0	1,982	21.8	11.0	1,982	21.8	11.0	1,982	21.8	
1957	120.9	1,530	185.0	32.2	2,696	86.8	27.5	858	23.6	50.6	1,040	52.6	10.5	2,086	21.9	10.5	2,086	21.9	10.5	2,086	21.9	
1958	121.3	1,649	200.0	32.7	2,850	93.2	26.3	932	24.8	45.6	1,140	52.0	16.3	1,840	30.0	16.3	1,840	30.0	16.3	1,840	30.0	
1959	109.1	1,512	165.0	29.7	2,657	78.9	24.6	984	23.9	42.4	964	40.9	12.7	1,677	21.3	12.7	1,677	21.3	12.7	1,677	21.3	
1960	119.0	1,260	150.0	31.5	2,311	72.8	26.8	784	21.0	47.2	760	35.9	13.5	1,504	20.3	13.5	1,504	20.3	13.5	1,504	20.3	
1961	119.0	1,361	162.0	31.0	2,513	77.9	24.6	650	16.0	49.4	895	44.2	14.0	1,707	23.9	14.0	1,707	23.9	14.0	1,707	23.9	
1962	118.6	1,467	174.0	29.3	2,659	77.9	24.4	840	20.5	51.8	1,019	52.8	13.1	1,740	22.8	13.1	1,740	22.8	13.1	1,740	22.8	
1963	118.4	1,546	183.0	28.2	2,837	80.0	24.2	926	22.4	52.8	1,057	55.8	13.2	1,879	24.8	13.2	1,879	24.8	13.2	1,879	24.8	
1964	121.9	1,641	200.0	29.5	3,034	89.5	25.5	992	25.3	54.1	1,089	58.9	12.8	2,055	26.3	12.8	2,055	26.3	12.8	2,055	26.3	
1965	122.5	1,633	200.0	29.8	3,020	90.0	25.5	988	25.2	54.4	1,105	60.2	12.8	1,922	24.6	12.8	1,922	24.6	12.8	1,922	24.6	
1966	123.7	1,738	215.0	30.3	3,182	96.4	25.0	1,108	27.7	55.5	1,178	65.4	12.9	1,977	25.5	12.9	1,977	25.5	12.9	1,977	25.5	
1967	126.4	1,820	230.0	30.3	3,307	100.2	25.5	1,106	28.2	57.1	1,299	74.2	13.5	2,030	27.4	13.5	2,030	27.4	13.5	2,030	27.4	
1968	126.8	1,696	215.0	30.0	3,180	95.4	25.0	1,016	25.4	58.7	1,158	68.0	13.1	2,000	26.2	13.1	2,000	26.2	13.1	2,000	26.2	
1969	128.4	1,713	220.0	30.5	3,210	97.9	25.3	1,075	27.2	58.8	1,158	68.1	13.8	1,942	26.8	13.8	1,942	26.8	13.8	1,942	26.8	
1970	129.2	1,858	240.0	31.2	3,417	106.6	25.6	1,223	31.3	58.5	1,289	75.4	13.9	1,921	26.7	13.9	1,921	26.7	13.9	1,921	26.7	
1971	131.0	1,878	246.0	32.5	3,465	112.6	25.9	1,185	30.7	58.5	1,306	76.4	14.1	1,865	26.3	14.1	1,865	26.3	14.1	1,865	26.3	
1972	131.2	1,829	240.0	33.0	3,315	109.4	25.2	1,370	35.9	57.6	1,186	68.3	14.4	1,833	26.4	14.4	1,833	26.4	14.4	1,833	26.4	
1973	132.2	1,891	250.0	33.7	3,353	113.0	26.5	1,298	34.4	58.1	1,294	75.2	13.9	1,971	27.4	13.9	1,971	27.4	13.9	1,971	27.4	
1974	133.8	1,981	265.0	34.2	3,509	120.0	27.2	1,360	37.0	58.6	1,358	79.6	13.8	2,058	28.4	13.8	2,058	28.4	13.8	2,058	28.4	
1975	135.0	2,000	270.0	34.5	3,536	122.0	27.7	1,397	38.7	58.8	1,367	80.4	14.0	2,064	28.9	14.0	2,064	28.9	14.0	2,064	28.9	
1951-55	113.7	1,375	156.3	28.3	2,466	69.8	25.4	787	20.0	50.7	984	49.9	9.2	1,804	16.6	9.2	1,804	16.6	9.2	1,804	16.6	
1956-60	118.9	1,484	176.5	31.9	2,596	82.8	26.5	891	23.6	47.7	985	47.0	12.8	1,805	23.1	12.8	1,805	23.1	12.8	1,805	23.1	
1961-65	120.1	1,530	183.8	29.6	2,807	83.1	24.8	883	21.9	52.5	1,034	54.3	13.2	1,856	24.5	13.2	1,856	24.5	13.2	1,856	24.5	
1966-70	126.9	1,765	224.0	30.5	3,256	99.3	25.3	1,107	28.0	57.7	1,217	70.2	13.4	1,978	26.5	13.4	1,978	26.5	13.4	1,978	26.5	
1971-75	132.6	1,917	254.2	33.6	3,434	115.4	26.7	1,322	35.3	58.3	1,304	76.0	14.0	1,964	27.5	14.0	1,964	27.5	14.0	1,964	27.5	

1/ Acreage and production data for 1949-57 from Ten Great Years, People's Publishers, Peking, Sept. 1959. Data for 1958-75, ERS estimates based on official sources for total grain and on interpolation of weighted values for individual grains. Sums of individual grains may not equal total grain because of rounding.

2/ Miscellaneous grains include coarse grains (corn, barley, oats, rye, sorghum, and millet), pulses and other minor grains.

3/ Tubers include white and sweet potatoes, manioc, and taro on a grain-equivalent basis.

4/ Recent sources show 110 + m. t.

5/ Preliminary.



Appendix table 3--People's Republic of China: Area, yield, and production of cotton (raw), 1949-75, and 5-year averages 1951-75 1/

Year	Area	Yield		Production	
	1,000 hectares	Kg./ha.	Bales/ha. <u>2/</u>	1,000 m. tons	1,000 bales <u>2/</u>
1949 .....	2,770	160	.73	444	2,011
1950 .....	3,786	183	.84	692	3,178
1951 .....	5,485	188	.86	1,030	4,731
1952 .....	5,576	234	1.07	1,304	5,989
1953 .....	5,180	227	1.04	1,174	5,392
1954 .....	5,462	195	.90	1,065	4,891
1955 .....	5,773	263	1.21	1,518	6,972
1956 .....	6,256	231	1.06	1,445	6,637
1957 .....	5,776	284	1.30	1,640	7,532
1958 .....	5,723	280	1.28	1,600	7,349
1959 .....	5,700	237	1.09	1,350	6,200
1960 .....	5,300	171	.78	905	4,157
1961 .....	3,700	240	1.10	890	4,088
1962 .....	3,400	294	1.35	1,000	4,593
1963 .....	4,050	272	1.25	1,100	5,052
1964 .....	4,500	333	1.53	1,500	6,889
1965 .....	4,770	346	1.59	1,650	7,578
1966 .....	4,700	385	1.77	1,810	8,313
1967 .....	4,800	404	1.86	1,940	8,910
1968 .....	4,750	381	1.75	1,810	8,313
1969 .....	4,700	377	1.73	1,770	8,129
1970 .....	4,800	416	1.91	2,000	9,186
1971 .....	4,850	458	2.10	2,220	10,196
1972 .....	4,900	434	1.99	2,125	9,760
1973 .....	4,850	526	2.41	2,550	11,712
1974 .....	4,850	515	2.37	2,500	11,482
1975 .....	4,850	495	2.27	2,400	11,023
1951-55 .....	5,495	222	1.02	1,218	5,595
1956-60 .....	5,751	241	1.11	1,388	6,375
1961-65 .....	4,084	301	1.38	1,228	5,640
1966-70 .....	4,750	393	1.80	1,867	8,570
1971-75 .....	4,860	485	2.23	2,359	10,835

1/ Acreage and production data for 1949-57 are from Ten Great Years, People's Publishers, Peking, Sept. 1959 and from other official sources. Data for 1958-77 are ERS estimates.

2/ Bales are 480 pounds.

Appendix table 4--People's Republic of China: Area, yield, and production of soybeans and major vegetable oilseeds, 1949-75, and 5-year averages, 1951-75 1/

Year	Soybeans				Peanuts				Rapeseed				Cottonseed			
	Area	Yield	Pro- duction	Area	Yield	Pro- duction	Area	Yield	Area	Yield	Pro- duction	Area	Yield	Pro- duction	Area	Yield
	1,000 hectares	Kg./ha.	1,000 tons	1,000 hectares	Kg./ha.	1,000 tons	1,000 hectares	Kg./ha.	1,000 hectares	Kg./ha.	1,000 tons	1,000 hectares	Kg./ha.	1,000 tons	1,000 hectares	Kg./ha.
1949	8,319	611	5,086	1,254	1,011	1,268	1,515	484	1,515	484	734	2,770	321	889	2,770	321
1950	9,602	864	8,125	1,344	1,294	1,739	1,423	480	1,423	480	683	3,786	366	1,386	3,786	366
1951	10,787	800	8,630	1,667	1,257	2,096	1,567	496	1,567	496	778	5,485	376	2,062	5,485	376
1952	11,679	815	9,519	1,804	1,284	2,316	1,863	500	1,863	500	932	5,576	468	2,610	5,576	468
1953	12,362	803	9,931	1,775	1,198	2,127	1,667	527	1,667	527	878	5,180	454	2,352	5,180	454
1954	12,654	718	9,080	2,097	1,320	2,767	1,706	515	1,706	515	878	5,462	390	2,130	5,462	390
1955	11,442	797	9,121	2,268	1,290	2,926	2,338	414	2,338	414	969	5,773	526	3,037	5,773	526
1956	12,047	850	10,234	2,583	1,292	3,336	2,165	426	2,165	426	923	6,256	462	2,890	6,256	462
1957	12,740	788	10,045	2,541	1,011	2,570	2,333	380	2,333	380	886	5,776	568	3,281	5,776	568
1958	9,850	1,066	10,500	2,373	1,180	2,800	2,528	435	2,528	435	1,100	5,723	560	3,205	5,723	560
1959	9,870	1,165	11,500	2,000	1,134	2,268	2,700	344	2,700	344	930	5,700	474	2,702	5,700	474
1960	9,300	882	8,200	1,820	1,022	1,860	2,900	347	2,900	347	1,005	5,300	342	1,813	5,300	342
1961	8,300	952	7,900	1,530	1,098	1,680	1,740	399	1,740	399	695	3,700	480	1,776	3,700	480
1962	7,900	975	7,700	1,520	1,072	1,630	1,390	447	1,390	447	621	3,400	588	2,000	3,400	588
1963	8,000	880	7,040	1,620	1,173	1,900	1,450	464	1,450	464	673	4,050	544	2,203	4,050	544
1964	8,300	836	6,940	1,880	1,218	2,290	1,600	519	1,600	519	831	4,500	666	3,000	4,500	666
1965	8,100	844	6,840	1,940	1,186	2,300	1,700	490	1,700	490	834	4,770	692	2,997	4,770	692
1966	8,000	850	6,800	2,000	1,180	2,360	1,750	500	1,750	500	876	4,700	770	3,620	4,700	770
1967	8,180	850	6,950	2,000	1,150	2,300	1,730	559	1,730	559	967	4,800	808	3,878	4,800	808
1968	8,000	810	6,480	1,900	1,132	2,150	1,710	548	1,710	548	937	4,750	762	3,620	4,750	762
1969	8,000	775	6,200	2,000	1,175	2,350	1,700	482	1,700	482	820	4,700	754	3,544	4,700	754
1970	8,000	862	6,900	2,100	1,262	2,650	1,675	555	1,675	555	930	4,800	833	3,998	4,800	833
1971	8,100	827	6,700	2,150	1,200	2,580	1,840	538	1,840	538	990	4,850	916	4,443	4,850	916
1972	8,400	774	6,500	2,200	1,091	2,400	2,100	567	2,100	567	1,190	4,900	868	4,253	4,900	868
1973	8,500	941	8,000	2,100	1,238	2,600	2,275	576	2,275	576	1,310	4,850	1,062	5,151	4,850	1,062
1974	8,800	1,079	9,500	2,100	1,286	2,700	2,375	487	2,375	487	1,157	4,850	1,031	5,000	4,850	1,031
1975	9,200	1,087	10,000	2,150	1,302	2,800	2,680	520	2,680	520	1,395	4,850	990	4,802	4,850	990
1951-55	11,785	785	9,256	1,922	1,273	2,446	1,828	485	1,828	485	887	5,495	443	2,434	5,495	443
1956-60	10,761	938	10,096	2,263	1,134	2,567	2,525	383	2,525	383	968	5,751	483	2,778	5,751	483
1961-65	8,120	897	7,284	1,698	1,154	1,960	1,576	464	1,576	464	731	4,084	602	2,459	4,084	602
1966-70	8,036	797	6,666	2,000	1,181	2,362	1,713	528	1,713	528	906	4,750	786	3,734	4,750	786
1971-75	8,600	942	8,140	2,140	1,222	2,616	2,254	536	2,254	536	1,208	4,860	971	4,719	4,860	971

1/ Acreage and production data for 1949-57 from Ten Great Years, People's Publishers, Peking, Sept. 1959 and other official sources. Data for 1958-75 are ERS estimates.

# CONVERSION EQUIVALENTS

<u>Common Chinese measures</u>	<u>English equivalent</u>	<u>Metric equivalent</u>
1 mou (1 ko in Tibet)	0.1647 acres	0.0667 hectares
1 liang (tael)	0.1102 lb.	0.0500 kilograms
1 jin (catty)	1.1023 lb.	0.5000 kilograms
1 tan (picul)	110.23 lb.	50.00 kilograms
1 catty per mou	6.693 lb./acre	7.5 kilograms/hectare
1 picul per mou	669.3 lb./acre	0.75 tons/hectare

## Conversion factors

One kilogram	equals	2.2046 pounds
One centner or metric quintal	"	220.46 pounds
One metric ton	"	2,204.6 pounds
One hectare	"	2,471 acres

## Pounds per bushel

Wheat, potatoes, and soybeans .....	60
Rye and corn .....	56
Barley .....	48
Oats .....	32

## Metric equivalents

<u>One bushel</u>	<u>Metric tons</u>
Wheat, potatoes, and soybeans .....	.02722
Rye and corn .....	.02540
Barley .....	.02177
Oats .....	.01452
<u>One metric ton</u>	<u>Bushels</u>
Wheat, potatoes, and soybeans .....	36.743
Rye and corn .....	39.368
Barley .....	45.929
Oats .....	68.894

One metric ton of ginned cotton = 4.593 bales of 480 pounds; or 4.409 running bales of 500 pounds.

North Korea: 1 chongbo equals 2.45 acres or 0.99174 hectares.







UNITED STATES DEPARTMENT OF AGRICULTURE  
WASHINGTON, D.C. 20250

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